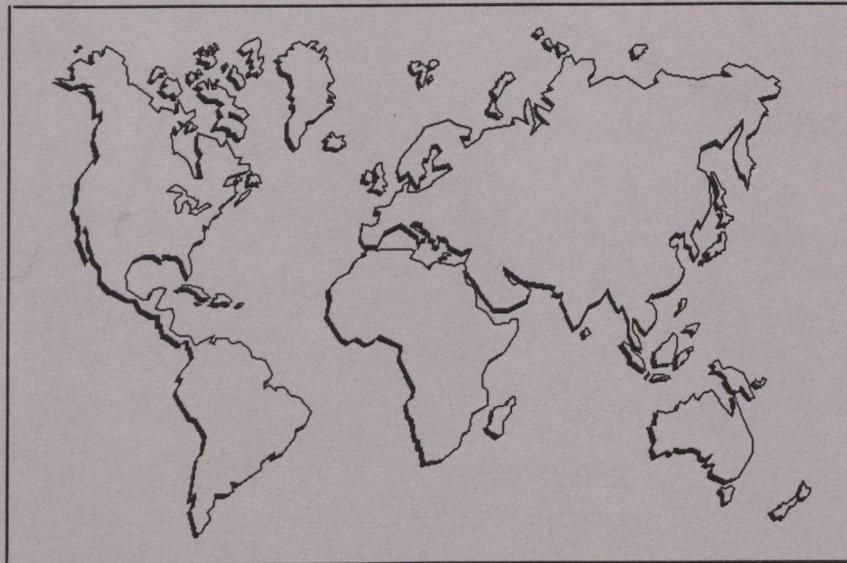


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A Report On The
CHILEAN FISHERY SECTOR



Dept. of External Affairs
Min. des Affaires extérieures

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Prepared by William C.T. Polushin
for the
Canadian Embassy in Santiago, Chile
November 1994

EXECUTIVE SUMMARY

Squeezed between the Andes and the Pacific, Chile enjoys a coastline that extends over 4,300 kilometres. Despite having such privileged access to ocean resources, large-scale fishing did not begin in Chile until the 1960s. Since that time though, the fishery sector has taken on an increasingly important role in Chile's economy. In 1993, primary fishing activities accounted for 1.07% of the country's Gross Domestic Product. When industry specific manufacturing functions are factored in (i.e. processing), that figure approaches 2.0%.

Taken alone, these figures do not necessarily convey the impact that the fishery sector has on the Chilean economy. To fully grasp the industry's importance, one should also analyze Chile's export and investment statistics. In 1993 for example, fisheries represented 12.4%, or US\$1.172 billion of the total US\$9.416 billion in export revenues. This is down from the US\$1.295 billion that the sector generated in 1992, but based on results to July, 1994, the industry is poised to equal or better the mark achieved during its 1992 peak (during the first seven months of 1994, the fishing industry exported US\$755.5 million worth of fish and fish products, a year over year increase of 12.3%). The fishery sector, along with agriculture and forestry, is now considered to be the core of Chile's non-traditional export effort.

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Total investment in Chile's fishery sector is now in excess of US\$2 billion, US\$200 million of which is directed towards salmon and trout farming operations. Recent investments include refitting processing plants and introducing new technology to improve product quality and reduce the risk of contamination. According to a recent study carried out by industry analysts, an additional US\$600 million will probably be invested across the sector within the next five years. This money will be directed towards further modernization of the industry.

Among one of the leading fishing nations of the world, Chile's fishing industry recorded landings of 6,190,648 metric tons in 1993. Although impressive, this represented a 6.6% drop from the 1992 catch. Sharp reductions in the landings of sardines and hake, two of the industry's primary resources, accounted for the bulk of the decline. A prolonged "El Niño" current, coupled with the overexploitation of various fish stocks has made the pelagic, demersal and benthonic fisheries increasingly unstable. So much so, Chilean fishery regulators are now managing demersal species such as hake and Sea bass (cod) landings through a quota system.

It is important to recognize that although 1993 can be considered an off year for the Chilean fishing industry, it by no means signifies the beginning of a downward trend. While it is true that Chilean authorities now face the challenge of maintaining the level of landings without compromising the industry's long term sustainability, Chile's fishery sector is poised to remain an integral and growing presence in the Chilean economy. Over the period 1990 to 1992, the sector jumped from 5.4 metric tons to over 6.6 million metric tons in total landings, and based on results to July, 1994, 1993 losses should be more than offset by advances made during the calendar year.

Broadly defined, the Chilean fishery sector can be separated into three distinct fisheries: pelagic, demersal and benthonic. The pelagic fishery, which is comprised of dark-fleshed fish such as

Jack mackerel, sardine, and anchovy, is by far and away the largest of all fisheries, accounting for 91.0% of 1993 landings. The demersal fishery, which includes all lean white-fleshed fish such as hake and Sea bass represented another 4.1% of 1993's catch, with the remaining 4.9% coming from the benthonic fishery (mollusks, algae and equinoderms).

In practical terms though, the Chilean fishing industry can essentially be separated into two major industrial sub-sectors: fish meal and aquaculture. Of the total 5,863,550 metric tons of fish landings in 1993, 87.5% went towards the production of fish meal (principally from the pelagic stocks). Chile is now second only to Peru in the export of this product, representing 30% of world supply (prior to the recent revival of the Peruvian fish meal industry, Chile held the number one position).

Close to 930,000 metric tons of fish meal were exported from Chile in 1993, or over 75% of the sector's export volume. As a percentage of export earnings though, fish meal's contribution drops significantly. In 1993, fish meal accounted for over US\$367 million or 31.3% of the fishing industry's export revenues. This is down 32.2% from 1992, reflecting both a softening in the international demand for fish meal and a substantial drop in fish meal prices during 1993. An increase in international fish meal supply, principally due to expanded production by Peru, pushed prices down from 1992 levels of US\$500 - 550/metric ton to as low as US\$300/metric ton in 1993 (the average price for the year was US\$387.80/metric ton).

Results to July, 1994, indicate Chile's fish meal industry will enjoy higher earnings in 1994. Over the first seven month of this year cumulative production of fish meal was up 36.3% (to 1,022,999 metric tons), and although prices for Chilean fish meal averaged only US\$350 during the first six months of 1994, prices into July were moving towards the US\$400/metric ton mark. A rise in the landings of pelagic species in the north of Chile (particularly anchovy), stronger international demand for fish meal in 1994, and the increasing production of a higher quality fish meal, otherwise known as prime, have all played a role in helping the industry realize these gains.

In contrast to the fish meal industry, which is now in the mature stage of its life cycle, Chile's aquaculture industry is "riding a wave" of prosperity that began in the mid 1980s. While representing only 2.2% (135,092 metric tons) of total landings in 1993, the aquacultural sub-sector accounted for more than US\$300 million, or more than 25% of total export earnings for the entire fishery sector (primarily driven by salmon and trout exports). Over the period 1992 to 1993, the total harvest of salmon and trout increased 24.5% (from 62,205 metric tons to 77,480 metric tons), the total harvest of mollusks jumped 43.0% (from 6,269 metric tons to 8,964 metric tons) and the total harvest of algae rose a marginal 1.8% (from 47,807 metric tons to 48,648 metric tons).

As was the case in Norway, Scotland and Canada, the growth of salmon and trout farming in Chile has been explosive. In less than a decade Chile's output of salmon and trout has shot up from a few hundred metric tons to over 60,000 metric tons in 1993 (dressed weight). Chile is now second only to Norway in the production of these species. Almost all Chilean salmon and

trout resources destined for export (98.2% in 1993) are processed as either frozen (67.4%) or chilled products. The vast majority of these products (87.0% of the total value of salmon and trout exports in 1993) are being shipped to either Japan or the United States.

In addition to being the world's low cost producer of aquacultural products, Chile enjoys access to a maze of fjords and archipelagos that are being fed by the crystalline waters of the Antarctic. Water temperatures do not vary much from season to season so the salmon and trout grow throughout the year and are ready for harvesting four to six months earlier than in northern countries. Factoring in Government policies that are supportive of the aquacultural industry, the end result is an industry that should remain competitive well into the next century.

Conservative estimates indicate that aquaculture's contribution to the Chilean fishery sector will be around 50% by 1997. Included in this forecast would be the production and exportation of 100,000 metric tons of salmon and trout (valued at approximately US\$500 million), the production of 4,000 metric tons of scallops (valued at US\$50 million), and the continued escalation in the production of algae.

Sustained growth in Chile's aquaculture industry, and for that matter, the entire Chilean fishery sector, is expected to come as a result of product diversification via the incorporation of new species and new processes. Among the more recent trends: an increase in the value added to existing products, and the research and development of new ocean and cultivated species such as turbot, Chilean abalone, shrimp, and sea urchins.

As a market, the Chilean fishery sector affords Canada various opportunities on an export, strategic alliance, and direct foreign investment level. That said though, the core of these opportunities (at least this point in time) tend to be very specific or niche oriented. The following list is a brief summary of those areas which have been cited as having the greatest commercial potential for Canadian business:

1. Export of Canadian Goods

- a. Fishing and aquacultural equipment
- b. Fertilized fish eggs
- c. Vaccines and diagnostics
- d. Lobster

2. Strategic Alliances

- a. Joint ventures
- b. Transfer of technology
 - i. value-added product processing
 - ii. post-processing technology
 - iii. systems for controlling aquacultural diseases

3. Export of Canadian Services

- a. Environmental consulting

b. Resource and coastal zone management consulting

4. Direct Foreign Investment

- a. Aquaculture
- b. Processing facilities

5. Value-added Processing in Canada

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1. THE COUNTRY

1.1 Area and Geography

Chile is a long, narrow ribbon of land stretching almost 4,320 km (2,700 miles) along the southwestern coast of South America. Although one of the longest countries in the world, it ranges from only 96 km to 400 km (60 mi. to 250 mi.) wide. Chile is wedged between the Andes mountains on the east and the Pacific ocean on the west; it borders Peru on the north, and Bolivia and Argentina on the east. Southern Chile is an archipelago with Cape Horn at its tip. Here the Atlantic and Pacific oceans meet.

Chile has four distinct and well-defined geographic regions: the northern desert (one-fourth of the country's land area); the high Andean sector; the central valley; and the southern lake district and archipelago. In order to decentralize the administration of existing and potential natural resources the country has been divided into 13 Regions, including the Metropolitan Region, an area that encompasses the capital Santiago and its surroundings.

The northern part of Chile (Regions I to IV), which includes some of the most barren desert in the world, is rich in mineral deposits such as copper, gold, sulphur, phosphates and nitrates. The fishing industry is also important in this area. The central valley (Regions V to X) has the largest population and contains most industrial and agricultural development. Climatic conditions make forestry and agriculture of considerable importance in this area. The far south of Chile (Regions XI and XII), which includes Tierra del Fuego, the largest island in the southern archipelago, is mostly dedicated to cattle and sheep raising. The area produces some natural gas and supplies about 23 per cent of Chile's petroleum consumption.

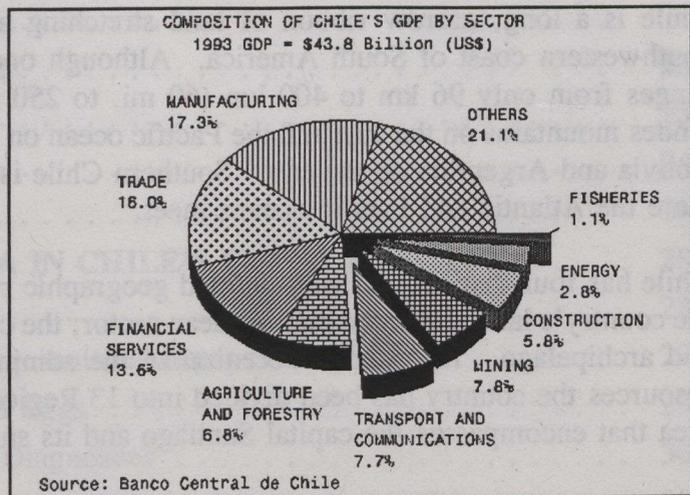
1.2 Government and Political Situation

The much heralded success of Chile's return to democracy was marked by the successful December 11, 1993 elections and the inauguration of President Eduardo Frei on March 11, 1994. With the election of President Frei, the Concertacion Nacional centre-left coalition was able to retain its solid majority in the House of Deputies, although The Senate is still being controlled by senators oriented to the right.

President Frei was elected with 58% of the popular vote as Chileans considered he was best able to continue the sound management, consistent economic growth and expanding social programs which were the hallmarks of former President Aylwin. While Frei is a businessman who is somewhat more to the centre than Aylwin, he has promised a strong campaign to reduce poverty. Major domestic issues to be addressed include education, health care, and improved infrastructure. Frei has indicated that he will seek broad consensus on major issues which bodes well for continued stability during his six year term of office.

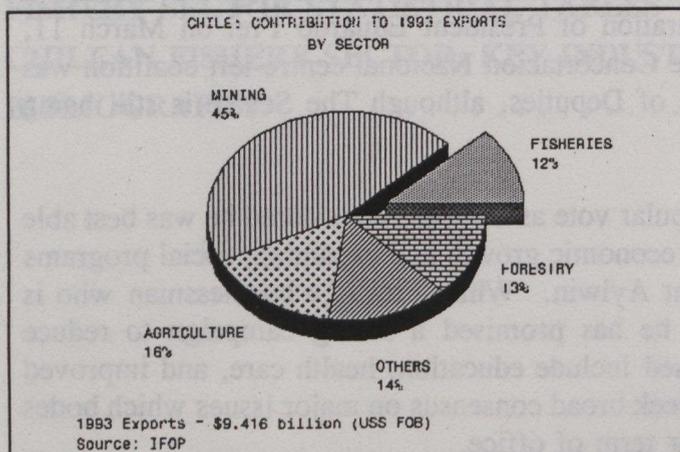
1.3 Economic Overview

Chile is now entering its eleventh consecutive year of economic growth, with Gross Domestic Product (GDP) having realized an average increase of 6% per annum over this period. In 1993, GDP reached US\$43.8 billion, a gain of over 6% from 1992. As the Chilean Government tries to reduce inflationary pressures that have remained stubbornly around the 12-13% range over the past two years (12.7% in 1992 and 12.2% in 1993), it is expected that the growth rate will slow somewhat to around 4-5% during 1994. Considering Chile's economy expanded by 4.0% in the first two quarters of this year (as compared to the first six months of 1993), this projection appears to have merit.



Capital investment in Chile reached an unprecedented 27% of GDP in 1993, an amount which favours sustained future growth and productivity in the country. International markets have also shown an increasing interest in Chile, with materialized direct foreign investment recording an historic 6.1% of GDP for the same period.

From 1990-1993, the incidence of poverty fell dramatically from five to four million people. The number of Chileans still living in extreme poverty though, is in excess of one million. Improvements in the reduction of poverty in Chile can be attributed, in part, to increases in the wages paid to the labour force. Real wages rose by an average of 4.3% in 1993 after a 4.5% rise in 1992. Per capita income is now US\$3,300 (1994), which officially makes Chile a middle-income nation (as defined by the United Nations).



Chile is very competitive in a number of foreign markets, with exports totalling US\$9.416 billion in 1993, or 21.5% of GDP. While mining still represents the single most important component of Chile's export revenues (45% in 1993), increasing diversification of the economy into fisheries, forestry and agriculture have ensured a reduction in the relative

importance of the mining sector. Future growth in exports will be greatest in Latin America and Asia as Chile attempts to diminish its reliance on U.S. and European markets. As well, greater

emphasis will be made on producing and exporting higher value-added products from the natural resources, manufacturing and services sectors.

2. THE ORIGIN AND EVOLUTION OF THE FISHING INDUSTRY

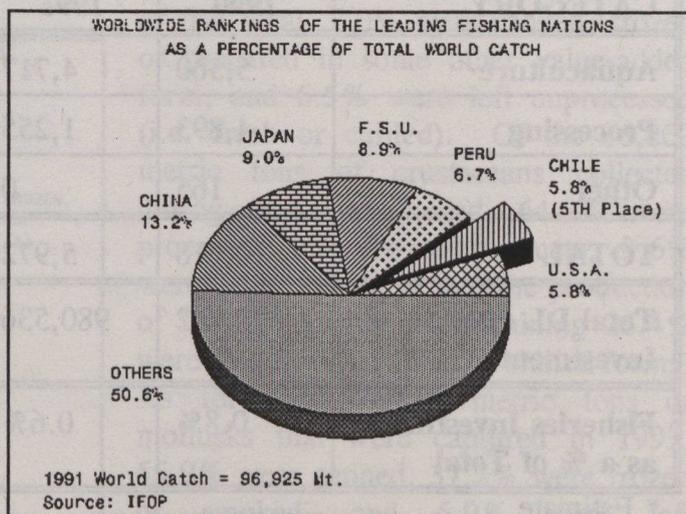
2.1 Background¹

Large-scale fishing in Chile began in the 1960s, when the Production Development Corporation (CORFO) adopted a policy of encouraging the production of fish meal in the north of the country. While it is true that the industry went through a crisis with the disappearance of the anchovy and an excess of investment, an entrepreneurial core was formed during this period which, with more experience, was to develop the fishing industry on a more solid basis, both in the north and south of the country.

A policy of export promotion was introduced in 1967. This, combined with moves toward a free market economy, had a positive effect on the fishing industry, leading to its expansion and diversification throughout the country. New species were put into production, including frozen and canned products, as well as the traditional areas of fish meal and oil.

In the 1980s, the farming of salmon products was introduced. High growth rates experienced by this subsector into 1990 gave further momentum to the development of fish farming in Chile, which is now second only to Norway in the production of farmed salmon and trout.

Comparatively, Chile ranks fifth among fishing nations of the world in terms of total catch (5.8% of total world catch). With respect to the country's contribution to total industry exports, Chile represents 2.8% of total revenues, or 13th place among fishing nations. The drop in Chile's global ranking between the two measures is primarily a reflection of the significant impact that fish meal has had on the country's fishery sector. For example, in 1993 83.2% of total commercial landings (6,190,648 metric tons) went towards the production of fish meal. Of the US\$1.172 billion that the fisheries generated in export revenues for 1993 though, fish meal represented only 31.3%.



¹Source: *Chile: Wealth of the Southern Seas*, PROCHILE, 1993.

2.2 The Fishery Sector Within The Chilean Economy

According to the Central Bank of Chile, the fishery sector contributed 1.07% to Chile's GDP in 1993 (based on 1986 pesos). This represented a slight decrease from the 1992 level of 1.12% of GDP. Although the sector constitutes a relatively small percentage of the country's total economic output, its importance to Chile's export effort is significant. In 1993, Chile earned US\$1.172 billion, or 12.4% of total Chilean export revenues, from fish and fish product exports (down from 1992 export revenues of US\$1.295 billion). Over the period 1989 to 1993 fishing exports have accounted for between 10 and 13 percent of the nation's total exports.

The role that the industry plays in generating and attracting foreign capital is also noteworthy. Beyond what has been earned in export revenues, the fishery sector can be credited with attracting US\$13.226 million of foreign investment in 1993, the bulk of which went into processing activities (US\$11.611 million). From 1990 to 1993, total materialized foreign investment (as defined by Decree Law 600) was US\$36.231 million. Provisional figures for the period corresponding to January to July, 1994 indicate that foreign investment in the Chilean fishing industry is already in excess of US\$14 million.

TOTAL FOREIGN INVESTMENT IN CHILE'S FISHERY SECTOR DECREE LAW 600, 1990 - 1994 (thousands of US\$)

CATEGORY	1990	1991	1992	1993	1994*
Aquaculture	5,560	4,717	1,365	555	647
Processing	4,893	1,255	5,050	11,611	12,589
Other	165	0	0	1,061	1,060
TOTAL	10,618	5,972	6,415	13,226	14,296
Total DL 600 Investment	1,322,242	980,536	995,509	1,694,933	1,333,653
Fisheries Investment as a % of Total	0.8%	0.6%	0.6%	0.8%	1.1%

* Estimate

As a creator of employment, the fishing industry now employs approximately 124,000 workers or 2.6% of Chile's entire labour force (100,601 permanent and 23,456 temporary employees). Of the total, 44.3% are involved in artisanal activities, 13.5% in aquaculture, 14.9% in the industrial fishing fleet, and 27.3% in processing plants.

NOTE: The figures used to denote the fishery sector's contribution to Chile's Gross Domestic Product include all primary fishing activities except for processing, which is classified as a manufacturing function. When processing activities are factored in, the sector's contribution to the domestic economy in 1993 approached 2.0%.

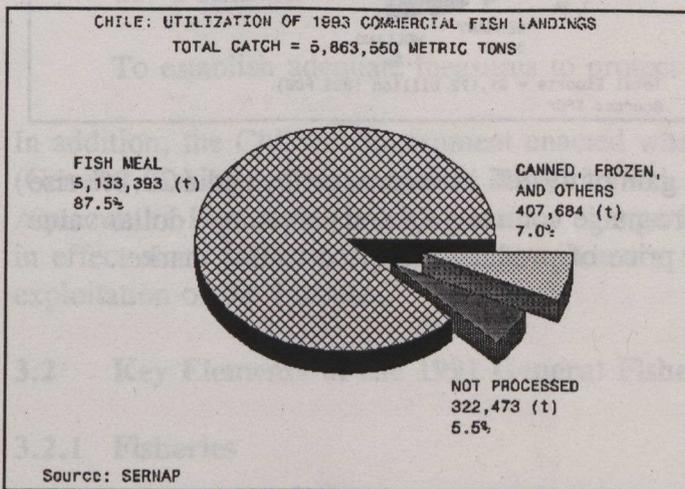
2.3 Industry Performance

Chile's fishing industry closed 1993 with negative results in both exports and landings. Among the more significant factors that contributed to the sector's misfortunes, were:

- a. an international recession that impacted Chile's principal export markets;
- b. a decrease in the extracted volume of the sector's principal resources;
- c. increasing global competition that has reduced the industry's comparative advantages in the commercialization of fish meal and fish oil.

Total fisheries landings over 1993 were 6,190,648 metric tons, a drop of 6.6% from the 1992 catch. Despite the decrease though, total landings for 1993 were still 1.1% greater than the average catch realized by the sector for the previous three year period. Evaluated on a species by species basis, there was a reduction in fish (-7.0%), mollusk (-18.4%) and crustacean landings (-13.3%), but a gain in landings of algae (23.1%), and equinoderms (5.8%).

Of the total 5,863,550 metric tons of fish landings in 1993, 87.5% went towards the production



of fish meal, 7.0% were canned, frozen or prepared in some other value-added form, and 6.5% were left unprocessed (i.e. fresh or chilled). Of the 26,200 metric tons of crustaceans collected during the same period, 64.0% were processed into frozen products, 9.6% were canned or went into the production of fish meal, and the remaining 26.4% were sold in either fresh or chilled forms. As for the 109,836 metric tons of mollusks that were captured in 1993, 55.9% were canned, 37.2% were frozen or smoked, and 6.9% were left unprocessed.

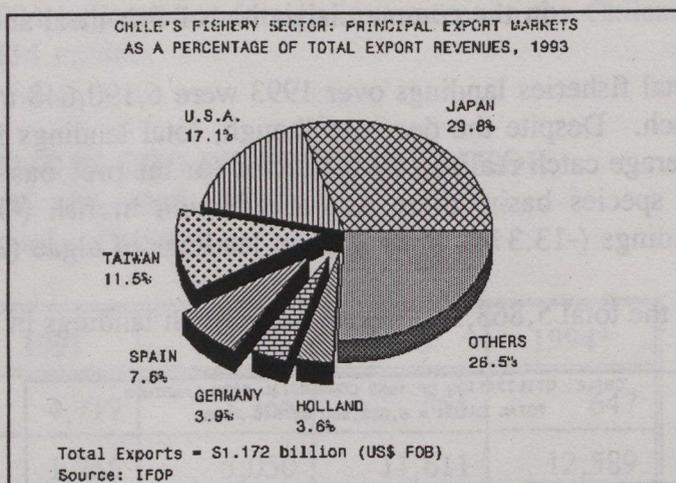
The utilization of 1993's catch is comparable to what occurred in 1992, with one general exception - there was a slightly higher degree of value-added processing in 1993, particularly in frozen products. This is a market trend that has been manifesting itself since the 1980s (largely fueled by the extraordinary growth of Chile's salmon and trout industry), and it reflects

a conscious decision on part of the fishery sector to diversify its operations well beyond the traditional production and export of fish meal.

As indicated previously, the fishery sector exported US\$1.172 billion or 1,232,944 metric tons worth of fish and fish products in 1993. These results represent decreases of 9.5% and 10.0%, respectively, from 1992 levels. As illustrated in TABLE 18 (Fishery Sector Statistical Tables), the pelagic fishery is the sector's dominant exporter, both in terms of tonnage (85.5%) and export revenues (40.2%).

Although 1993 was somewhat of a down year for the industry, it is important to recognize that this is only the second time in the past 18 years that Chile's fishery sector has experienced a year over year drop in the total value of its exports (in 1990, export revenues for the sector fell by 2.1% from 1989 levels). Based on industry results for the first seven months of 1994, it appears that Chile's fisheries are well poised to reverse the misfortunes of 1993, not only in terms of export revenues, but in terms of export volume and landings.

The primary export markets for Chile's fishery, as a percentage of the industry's export revenues, are Japan (29.8%), the United States (17.1%), Taiwan (11.5%) and Spain (7.6%). In comparison to 1992, the average price of products exported to Japan increased by US\$256/metric ton, from US\$1,249/metric ton to US\$1,505/metric ton. However, the quantity and the total value of exports to this nation dropped by 26.1% and 10.9%, respectively. Exports to the United States, in contrast, experienced a gain of 49.8% in volume terms and a 20.8% rise in dollar value. The difference between the percentage volume gain and percentage dollar value gain reflects a 19.3% decrease in the average price of products exported to this market.



3. REGULATORY ENVIRONMENT

3.1 National Fishing Policy

The trend in the fisheries sector over the past five years has been one that emphasizes improved resource management and expansion into new species and areas. Towards facilitating these objectives, the Government of Chile established a set of sector specific policies:

a. Fish Resources

To promote the largest possible catches compatible with the goal of sustainable harvests, as well as fish hatcheries and fish farming.

b. Fish Processing

To not directly participate or interfere in the fish processing industry, which corresponds to the private sector, while reserving the right to manage the marine resources upon which the industry relies.

c. Free Market

To foster free market wholesale pricing of fresh and processed fish by eliminating market distortions.

d. Pollution

To establish adequate measures to protect the marine environment from pollution.

In addition, the Chilean Government enacted what is called the "Ley de Pesca y Acuicultura" (General Fishing and Aquaculture Law) in 1991. The introduction of the 1991 Fisheries and Aquaculture Law represented a welcome change from the previous legislation, which had been in effect since 1931, and provided the industry with a framework that supported sustainable exploitation of the fisheries.

3.2 Key Elements of the 1991 General Fishery and Aquaculture Law²

3.2.1 Fisheries

Fisheries Access: The Fishery and Aquaculture Law adopts as its starting point the principle of free access to all fisheries. However, when the National Fisheries Council pronounces a fishery as "incipient", "fully exploited", or "in recovery from over-exploitation", access may be limited.

²Source: *Industrial Outlook Report: Chilean Fisheries Sector*
Embassy of the United States of America, Santiago, October, 1993.

When a fishery is declared "fully exploited" and a global annual quota is set, the Sub Secretariat of Fisheries may auction, through public bidding, up to five percent (in weight) of the quota established, allowing for the entry of new operators.

Under the terms of the 1991 legislation, artisanal fishermen have exclusive fishing rights within five miles of the Chilean shoreline. This exclusivity provides the artisanal subsector with longer term stability and security, although it does not guarantee sustainable and effective exploitation of the available fish stocks. Insufficient financial resources among artisanal fishermen has limited their ability to fully exploit the five mile zone.

Ownership: Majority ownership of fishing vessels is reserved for Chilean investors. Foreign investors may hold minority interests of up to 49%. This constraint can be waived if a foreign investor's home country grants majority ownership rights in fishing vessels to Chilean investors. Foreign investors may hold up to a 100% interest in fish processing and aquaculture operations.

Factory Vessels: Both Chilean and foreign-owned factory vessels are forbidden from operating within Chilean territorial waters or the 200-mile Exclusive Economic Zone (E.E.Z.). This regulation does not apply south of 47°S 00' south and 150 nautical miles west of the straight base line if a particular fishery is not considered "fully exploited."

Transferable Fishing Rights: Authorization to fish in a "fully exploited" fishery may be transferred to a third party. "Fully exploited" fisheries are regulated by the imposition of annual quotas limiting the number of vessels operating. If the yearly quota is auctioned, the special fishing rights emerging from and associated with the quota may be divided, transferred, inherited, and rented.

3.2.2 Aquaculture

Site Permits and Authorizations: Site permits (land/water concessions) and authorizations (permits to use fresh or ocean water) to develop aquaculture activities are granted for indefinite periods of time, and are transferable, inheritable and may be mortgaged or otherwise pledged.

Ocean Ranching: "Salmon ranching" operations (i.e. producers which have released salmon to be subsequently harvested in the open seas) are the only entities entitled to legally catch those salmon. Salmon fishing is forbidden in those areas when salmon migrate or spawn. Seasonal fishing bans are applied in areas where wild salmon populations are established.

3.3 Institutional Framework

The following public organizations represent the core of the institutional framework in the fisheries sector:

- a. **Subsecretariat of Fisheries:** sets policies and mechanisms for their enforcement, as well as authorizing new fishing activities, subject to a report by the National Fisheries Service.
- b. **National Fisheries Service (SERNAP):** implements and enforces national fishing regulations. It also certifies the sanitary quality of export products, as well as compiling industry statistics.
- c. **Fisheries Development Institute (IFOP/CORFO):** is a fishing research center that carries out scientific and technical research on Chile's fisheries, for both the public and private sectors. IFOP also compiles industry statistics, but concentrates primarily on fishery exports.
- d. **Armada de Chile/Chilean Navy:** in addition to its national defence responsibilities, the Chilean Navy authorizes and distributes site permits (land/water concessions) for aquaculture activities in Chilean territory.

3.4 Types of Fishing Permits³

There are five types of fishing permits, depending on the species involved:

- a. **Free access** - for all species not specified elsewhere
- b. **Full exploitation** - albacore
- c. **Developing** - cod
- d. **Recovering** - Red crawfish
- e. **Benthonic** - abalone

A species may also be declared to have reached a state of full exploitation. This is a prior step, subject to technical studies, to be classified ready for full exploitation. Jack mackerel, sardine, anchovy, Southern hake, Common hake, and Golden Ring all fall into this category.

3.5 Foreign Investment

In addition to the requirements of the General Fishing Law, foreign investors must also comply with Decree Law 600, which regulates the infusion of foreign capital into Chile.

³Source: Chile: Fishing Investment Opportunities
Foreign Investment Committee, Chile, 1992.

3.5.1 Foreign Investment Law⁴

The Foreign Investment Statute, Decree Law 600, is a very simple piece of legislation based on the principle of non-discrimination between foreign and local investors. It guarantees foreign investors access to the Formal Market for repatriation of capital and profits and grants them special franchises relating taxes and customs duties.

Pursuant to the Law, foreign individuals, corporations or entities may bring capital into the country in the form of freely convertible foreign exchange, tangible assets, technology that can be capitalized, and loans tied to foreign investment projects. The authorization of foreign investment in accordance with the Law is contained in a contract entered into by the investor and the State of Chile.

Since the rights and guarantees awarded to the foreign investor are included in a contract, they may not be abrogated during the period for which they have been agreed upon, even if new legislation containing different rules is enacted. Amendments to the contract are possible only with the agreement of both parties.

The petition to obtain the referred authorization must be granted by the Foreign Investment Committee, which is the only entity legally authorized to accept the entrance of capital from abroad under Decree Law 600 and to stipulate the terms and conditions of the corresponding contracts. This is a very agile institution and the procedure is simple.

The contract establishes the term in which the capital must be brought into the country, which may not exceed eight years for mining investments and three years for all others.

Foreign investors may repatriate their capital and related profits after one year has elapsed, counted as from the date in which it has been brought in. Related profits may be repatriated at any time, without limitation as to the amount thereof, previous payment of Chilean taxes.

In the case of manufacturing or extractive industry projects which exceed US\$50,000,000, all or part of the proceeds from exports can be maintained abroad in order to cover expenses or to repatriate capital or profits. The foregoing must be agreed upon in the foreign investment contract.

The foreign exchange required for the repatriation of capital can only be acquired with the proceeds arising either from the sale of the shares or rights representing the foreign investment, or from the sale or liquidation of the business acquired or organized with the investment.

⁴Source: *Investing in Chile, 1993 Edition*, Langton Clarke.

4. PRODUCTIVE STRUCTURE OF THE CHILEAN FISHERIES SECTOR⁵

4.1 Fishing Fleet

Chile's fishing fleet can be separated into two main categories, the industrial/commercial fleet and the artisanal/independent fleet. Of the total 8,117 boats registered, 962 belong to the industrial group, while the remaining 7,155 fall under the jurisdiction of the artisanal fishermen. Artisanal landings, which are extracted from the coastal waters of Chile, are targeted for direct human consumption. Industrial landings, in contrast are primarily used for export purposes.

4.1.1 Industrial Fleet

By definition, the industrial fleet is comprised of those vessels that have a weight of over 50 tons. Typically, these vessels are equipped with modern navigation and fishing systems requiring advanced technology and greater capital investment. Industrial vessels are further classified according to the fishing technique and type of fish processing used, as illustrated in the following table:

INDUSTRIAL FISHING FLEET

Seiners	502
Trawlers	85
Boulters	247
Others (includes gill netters, trappers, and harpooners)	128
TOTAL	962

Seiner Fleet: This fleet uses seine nets to capture pelagic fish species. It consists of 502 boats with a total storage capacity of 118,163 metric tons. These vessels range in size, with the upper limits being 63 metres in length, and an engine size of 3,000 HP.

Operating principally in Regions I to V and VIII, the seiner fleet has undergone substantial modernization of equipment in recent years, incorporating seine nets of up to 1,200 metres long and 150 metres deep, as well as utilizing sophisticated electronic equipment and prospecting planes to locate fish. The potential for additional modernization advances are

⁵Source: *Chile: Fishing Investment Opportunities*
Foreign Investment Committee, Chile, 1992.

definitely evident though, especially considering that 39.6% of the fleet is between 21 and 25 years old.

Trawler Fleet: Dedicated to the capture of demersal species in the Central South and Far Southern Zones, the trawler fleet consists of 85 boats with a total holding capacity of 39,300 metric tons. Of the total, 12 vessels are factory ships with on-board processing capabilities and 73 use only ice to preserve the catch until it can be unloaded at on-shore processing plants.

The trawlers vary in length (68-105 metres), engine size (2,000-4,500 HP), and age (from 8 to 30 years old). The average age of the fleet is listed as 23 years.

Boulter Fleet: Owned primarily by joint Chilean-Spanish companies, this fleet consists of 247 vessels, of which 20 are factory ships and 227, ice only. The vessels operate in the open ocean and inland channels south of parallel 44°30' S.L.

The factory vessels found in the boulder fleet range between 39.5 and 92 metres in length, in engine sizes between 400 and 2,100 HP, and cumulatively represent a hold capacity of 7,422 metric tons. The ice-trawler segment of the fleet, in comparison, are between 15 and 54.35 metres in length, utilize engines that vary between 165 and 1,400 HP, and cumulatively possess a hold capacity of 11,856 metric tons. The age of the boats in the boulder fleet ranges between 2 and 5 years old.

4.1.2 Artisanal Fleet

As defined by the General Fishing and Aquaculture Law, this fleet consists of boats of less than 18 metres and 50 tons. In addition, the builder of the boat must be an artisan fisherman, who may not own more than two artisan boats.

The fleet consists of 7,155 wooden boats nationwide, ranging in length between 3 metres and 18 metres, in engine size between 3.5 HP and 400 HP, and in age between 1 and 20 years. Approximately 70% of the vessels in the artisanal fleet are at least 12 metres in length, possessing engines with a size of between 150 and 400 HP.

4.2 Processing Plants

The fish processing industry consists of 390 approved fish, shellfish and algae processing plants, which are concentrated in Regions V, VIII and X. Of the 390 industrial plants, 267 are primarily dedicated to freezing processes, 124 to canning and 65 to fish meal and oil.

The processing plants can operate on two or more lines simultaneously for the production of fish meal or oil, or chilled, frozen or canned seafood. There are currently 688 production lines operating in the 390 processing plants.

5. INVESTMENT

Based on PROCHILE estimates from March 1993, and data obtained from Chile's Foreign Investment Committee and Estrategia (a Chilean business publication), investment in Chile's fishery sector, including the fishing fleet, processing plants and aquaculture is now in excess of US\$2 billion. Recent investments include refitting processing plants and introducing new technology to improve product quality and reduce the risk of contamination.

INVESTMENT IN THE CHILEAN FISHING INDUSTRY

FISHERIES SUBSECTOR	THOUSANDS OF US\$
Processing	1,500,000
Freezing and Canning	250,000
Fish Farm Centres*	200,000
Independent Fleet	100,000
TOTAL	2,050,000

* Not including exploitation capital

According to a recent study carried out by industry analysts, an additional US\$600 million will probably be invested across the sector within the next five years. This money will be directed towards further modernization of the industry.

Chile's fishery sector continues to attract foreign investment, but it is now primarily directed towards fish processing, and to a lesser extent, towards aquacultural operations. Foreign investment in fishing itself came to a halt after the enactment of the General Fishery and Aquaculture Law in 1991, which essentially barred fishing vessels majority-owned by foreign interests from operating in Chile's territorial waters or Exclusive Economic Zone. It also forbade factory vessels, whether Chilean or foreign, from operating anywhere in Chilean waters with the exception of the southernmost part of the Exclusive Economic Zone.

6. PELAGIC FISHERY

6.1 Resources

By definition, the pelagic species are living organisms that move freely in the superficial and subsuperficial layers of the ocean, forming large schools that do not depend upon the ocean substrate to accomplish their vital processes.

Chilean pelagic fishing consists primarily of five species - Jack mackerel, anchovies, sardines, Common sardines, and mackerel. Between the coast and the 200-mile limit, fish distribution varies according to the species. Jack mackerel is found throughout the area and beyond. Anchovies are found one to seven miles off the coast. Migrating with the seasons, sardines are found off the coast in summer and in the open ocean in the winter.

All pelagic resources are highly vulnerable to environmental changes, such as unpredictable shifts in the "El Niño" current. This, in addition to the fact that overfishing of pelagic stocks has stretched the fishery to its maximum biological sustainable level, has made the pelagic fishery extremely unstable. What could be one year's biologically sustainable level could be next year's ecological disaster.

To help combat the volatility of pelagic stocks, the 1991 General Fishery and Aquaculture Law has established that sardine, anchovy, and Jack mackerel fisheries all fall under the category of "fully exploited fisheries," thus freezing fishing effort in these fisheries at current levels. New fishing vessels are allowed to enter these fisheries only as replacements of old units or as new units which had been authorized at the time of the enactment of the law. Authorization of new fish meal plants is also limited.⁶

Pelagic production is largely exported as fish meal for animal consumption and fish oil for industrial use. During the 1970s, the pelagic industry was largely concentrated in Chile's north (Regions I to IV), but through the 1980s the fishery expanded as far south as Region VIII. In fact, Region VIII is now considered the core of the pelagic industry.

Chile supplies an astounding 30% of world fish meal demand. The global leader in this category during the 1980s and into the first part of the 1990s, Chile now trails behind Peru which exports 40% of the world total. Free market oriented reforms, coupled with a recovery in the anchovy stocks off its coastal waters have enabled Peru to regain its number one ranking.

The pelagic industry employs over 10,000 employees to operate and maintain its fishing fleet. There were 390 vessels fishing pelagic species in 1992, with another 79 to have potentially entered the fleet in 1993. As stipulated in the 1991 General Fishery and Aquaculture Law, once these new fishing units were added, the pelagic fleet would be frozen at this size.⁷

The processing industry for fish meal, fish oil and canned fish products employs some 5,000 workers. Canneries are largely concentrated in Regions I and VIII, although other types of processing facilities (i.e. surimi plants) are located in Region V. Canned production of fish is shared between the local and export markets (40% vs. 60%). Frozen products of pelagic species, with the exception of swordfish, have little popularity in most markets.

⁶Source: *Industrial Outlook Report: Chilean Fisheries Sector*
Embassy of the United States of America, Santiago, October, 1993.

⁷Source: *Ibid.*

6.2 Performance

The pelagic fishery recorded landings of 5.4 million metric tons in 1993, a decrease of 8.0% from 1992. Of this total, 59.7% were jack mackerel, 26.7% were anchovy, 9.5% were sardine, and the remaining 4.1% was a culmination of other pelagic species.

The bulk of 1993 landings, 54%, came from the central-south area of Chile (Regions V to VIII), with another 38% coming from the north zone (Regions I and II). The central-south fishery is supported by significant Jack mackerel, whereas the north is dominated by Jack mackerel, anchovy, and sardine stocks. Both areas suffered year over year reductions in landings (10.0% and 2.3%), largely reflecting the effects of overexploitation and the long lasting "El Niño" phenomenon that has plagued the north zone.

Pelagic exports totalled US\$471 million or 1,054,549 metric tons in 1993, down 27.7% and 11.9%, respectively, from 1992. Despite the considerable decrease in export revenues and tonnage, pelagic exports still constituted 40.2% of Chile's fishery sector exports in dollar terms and 85.5% in quantity terms. The significant disparity between the two sets of figures may be attributed to the following:

- a. The total value of fish meal exports fell 32.2% year over year. An increase in international fish meal supply, principally due to expanded production by Peru, pushed prices down from 1992's levels of US\$500-550/metric ton to as low as US\$300/metric ton in 1993 (the average price for the year was \$387.80).
- b. The increasing importance of other higher value-added products as a generator of export revenues. As illustrated in TABLE 19 (Fishery Sector Statistical Tables), apart from the value of exports of frozen fish products, which changed very little from 1992 levels, all other principal value-added commercial categories experienced growth.

6.3 Future Outlook

Statistically, 1994 is shaping up to be a rebound year for the pelagic fishery. Cumulative production of fish meal and fish oil to July, 1994, are up 33.3% (to 1,022,999 metric tons) and 71.9% (to 222,650 metric tons), respectively, over the same seven month period in 1993. Industry exports are demonstrating a similar resiliency. As of May, 1994, exports of fish meal had reached 519,000 metric tons, a 35.8% increase over the same period for 1993. Prices have also bounced back somewhat, with fish meal averaging US\$397.40/metric ton over the first five months of the year.

Aiding this recovery have been the following:

- a. There has been a substantial rise in the anchovy population in the north zone. Consequently, the pelagic landings in the area have also increased. Landings

destined for the production of fish meal have jumped from 3,411,789 metric tons (January - July, 1993) to 4,689,041 metric tons (January - July, 1994).

- b. Chilean producers have been upgrading their processing technology to enable them to produce a higher quality of fish meal, otherwise known as prime. In fact, a fifth of the fish meal industry in 1993 focused on prime meal made mainly from Jack mackerel (from the central-south coast), anchovy and sardine (from northern coasts close to Peru). By the turn of the century, prime may represent more than half of the fish meal production following the 1994 launch of eight new plants, all fitted with the latest Norwegian technology, in San Antonio.⁸

Essentially, Chile is attempting to differentiate its product from that of its international competitors (primarily Peru) based on quality. Considering the industry is moving towards a higher quality standard, Chile is well positioned to not only export more fish meal, but could do so at a higher price. At the close of 1993 for example, Chilean fish meal was selling for US\$370/metric ton, US\$40/metric ton more than what Peruvian fish meal was earning in international markets.

Despite these positive developments though, the Chilean pelagic industry (as is the case with the entire fishery sector) is entering a period of consolidation and restructuring that is expected to continue well into the latter part of the 1990s. Pressure from low prices, an increasingly competitive operating environment, and instability in the available fish stocks has forced companies to use different strategies to improve their long term chances of survival. By 1999, Chile's new vessels and plants will be run by a small group of owners employing fewer workers. According to Antonio Muñoz of Pesquera Coloso, "if catches continue as low as in the last three years, two owners in the north will be a lot."

7. DEMERSAL FISHERY

7.1 Resources

Demersal resources consist of fish and crustaceans that live close to the ocean floor and depend upon the ocean substrate to perform some of their vital processes. Included in this fishery are several species of hake, Sea bass, ling and other lean, white-fleshed fish, in addition to three species of crustaceans.

Demersal fish species vary between the south central zone (Regions IV to XI) and the far southern zone (Region XII). The most important species found in the south central zone are the Common hake (Pacific Silver hake) and Sea bass (cod). Other demersal species located in this area include Black ling and Elephant fish. Within the far southern zone, the Southern hake

⁸Source: Chile Inc.: The 1994 Sourcebook.

(Antarctic Queen), Golden ling (Golden kingclip), 3-Fin hake, Tail hake, and brotula represent the core of the demersal fish population.

The most important specie of crustaceans are decapola of the Lithodidae family. They include Southern King crab and False King crab (Snow crab), which are economically important in Regions X and XII. This specie also includes the Chilean Pandalid shrimp which are found primarily in Regions I to IV and VIII.

The expansion of the fishery within the fjords and channels of southern Chile (south of Region IX) in recent years has been pushing the demersal resources to their biologically renewable limits. At the conclusion of 1992, in an effort to alleviate this trend, Common hake, Southern hake, and Golden ling were declared to be "fully exploited." As a consequence, these species are now managed through a quota system which limits the total allowable catch of Common hake to 65,000 metric tons, Southern hake to 26,000 metric tons, and Sea bass to 5,000 metric tons (for fish caught south of 47°S). Under the terms of the 1991 General Fishery and Aquaculture Law portions of these global quotas can be auctioned off through a public bidding process.

Demersal species are processed into high-value products for human consumption, with almost 95% of production exported. While it is true the demersal fishery represented only 6.1% of the sector's export volume in 1993, demersal exports constituted a substantive 16.7% of total export revenues for the year - reflecting the ability of value-added fish products to garner higher prices (and typically higher margins).

The demersal industry employs close to 30,000 workers, the vast majority of which are located south of Region IV. Commercial activities are concentrated between Regions VIII and XII, where most of the 390 fish processing plants, two industrial fleets, and more than 4,000 artisanal fishing boats operate year round.

7.2 Performance

The demersal fishery experienced a 36.1% reduction in commercial landings from 1992 to 1993. Although the quotas established for Common hake, Southern hake, and Sea bass can be credited for some of the decrease, their cumulative effects do not account for the entire drop. For example, Southern hake contributed 20,117 metric tons to total demersal landings in 1993, a drop of 47.2% from the previous year. This catch was well within the 1993 quota set for Southern hake of 26,000 metric tons.

Among the other primary demersal resources, results for 1993 were as follows: landings for Common hake rose 2.6% to 64,262 metric tons, Sea bass dropped 28.6% to 22,008 metric tons (11,959 metric tons from international waters), Tail hake fell an astounding 61.5% to 82,580 metric tons, and 3-Fin hake recorded a catch of 27,607 metric tons, an increase of 436.2%. With respect to the crustacean species, landings of Pandalid shrimp essentially remained at 1992 levels (8,237 metric tons), while impressive gains in landings of King crab (up 26.0%) were largely offset by an equally impressive decrease in landings of Snow crab (down 28.0%).

To fully appreciate why combined demersal landings in 1993 were so much lower than in 1992, one must analyze the fishery's export statistics. During 1993, demersal exports totalled 74,677 metric tons or US\$195,963. Not surprisingly, these results represented decreases of 3.2% and 13.1%, respectively, from what the fishery was able to export in 1992. Similar to what transpired in the pelagic fishery, the international demand for Chile's demersal products was somewhat subdued during 1993 (particularly in Spain), thus putting downward pressure on the need for demersal resources.

The vast majority of demersal exports come in the form of frozen fish or frozen fish products (this includes crustacean species). In 1993, 84.8% of the fishery's export revenues and 90.6% of the fishery's export volume were processed as such (these figures are comparable to the 84.1% and 89.3% realized in 1992). The remainder of the export volume, and revenues, came from the sale of fresh/chilled fish or fish products.

The principal export markets for the demersal fishery are Spain, the United States, and Japan, although the relative importance of each nation may differ according to the species being exported. For example, in 1993 Spain was the number one importer of Chilean Golden ling and Southern hake (representing 88.7% and 88.6% of these species' export volume). Analysis of the export tendencies of Sea bass though, reveals that Japan was the primary importer of this particular demersal resource, accounting for 66.1% of its export volume (for the same period).

7.3 Future Trends

In contrast to the pelagic fishery, the demersal fishery is not expected to experience any sort of notable recovery in the immediate future (i.e. 1994 and into 1995). The primary reasoning behind this, is as follows:

- a. Two of the demersal fishery's principal resources, hake and Sea bass, are currently being managed through a quota system that will remain in effect until there has been a sufficient replenishment of these species in Chile's territorial waters. The ability of either the artisanal or industrial fleets to effectively exploit the demersal fish stocks beyond a certain level, is therefore limited.
- b. There has been an increase in the world supply of hake and Alaskan pollock over the past year. This, coupled with the fact that the demand for demersal products in Europe (one of Chile's primary export markets) is still depressed, has resulted in a general reduction in the prices for lean, white-fleshed fish in international markets. Although greater value-added processing of demersal resources should help Chile's demersal fishery sustain the overall value of its exports, it is unlikely the fishery will experience any rise in the volume of its exports.

The long term success of the demersal fishery though, is predicated on the ability of the industry participants, in both the public and private sectors, to effectively manage the exploitation of the demersal resources and to implement operational systems that result in the efficient and cost effective production of the various demersal species.

8. BENTHONIC FISHERY

8.1 Resources

Benthonic species are living organisms that spend their adult lives attached to the ocean floor, depending on the immediate surroundings to help carry out their vital processes. The sub-sector relies on landings of crab, mussels, clams, oysters, scallops, sea urchins, and seaweed, as well as rare, high-value species such as Chilean abalone (otherwise known as "loco").

The fishing and gathering of benthonic resources is primarily carried out by artisanal fishermen along the coastal waters of Chile. Although found nationwide, approximately 70% of benthonic landings are currently being extracted from Regions X to XII.

Benthonic resources, because of their sedentary characteristics, are highly vulnerable to fishing activity. In fact, all species supporting the benthonic industry are showing some degree of overexploitation. Due to the remoteness of the fishing grounds and the extensive network of landing sites used by the artisanal fishermen, efficient and effective control of overfishing is difficult.

Nevertheless, Chilean regulatory authorities have taken steps to improve upon the management of the benthonic resources. Among the more notable advances: geographical limitations on fishing, prohibitions against taking females carrying eggs, and the opening of a registry of artisanal fishermen to monitor their activities and size limits. As well, Chilean abalone is now under permanent ban with only a one-week-long, twice-a-year fishing season.⁹ Strong international demand for this species though, coupled with very attractive prices, have unfortunately made "loco" the target of illegal/underground fishing activities.

Apart from seaweed (which is dried), the benthonic industry processes most of its landings into canned and frozen products, sharing the demersal industry's processing facilities. Because of the value added processing associated with the benthonic species the benthonic industry, similar to the demersal industry, is able to secure higher than average prices for its fish and fish product exports. While only accounting for 3.5% of the total volume of Chilean fishery exports in 1993, the benthonic fishery brought in 18.2% of the sector's export revenues.

8.2 Performance

The benthonic fishery closed 1993 with mixed results. Total landings remained largely unchanged from 1992, growing 2.1% to 305,699 metric tons. The total value of benthonic exports though, increased 39.2%, year over year, to US\$212,954,200. This, despite a 7.0% decrease in the total volume of benthonic products exported in 1993. The substantial jump in

⁹Source: *Industrial Outlook Report: Chilean Fisheries Sector* Embassy of the United States of America, Santiago, October, 1993.

export revenues generated by the fishery in 1993 reflected a 49.7% increase in the average price of products exported over 1992, particularly for canned and frozen benthonic products. As of 1993, these two processing lines comprised 72.9% of the fishery's export value (up from 38.2% in 1992).

It is important to note that although total landings of benthonic species have been relatively constant over the past two years (1992-1993), changes in the composition of these landings have been considerable. Apart from squid, which is classified as a pelagic species, commercial landings of benthonic mollusks fell 20.7%, in addition to the 13.0% decrease in the landings of benthonic crustaceans. These losses were more than offset though, by impressive gains in the landings of algae (up 23.1% to 155,757 metric tons) and equinoderms (up 5.8% to 35,305 metric tons).

The principal export markets for the benthonic industry are Japan (for frozen products) and Taiwan (for canned products). Other significant export markets for the fishery include Spain, Singapore and the U.S.A.

8.3 Future Outlook

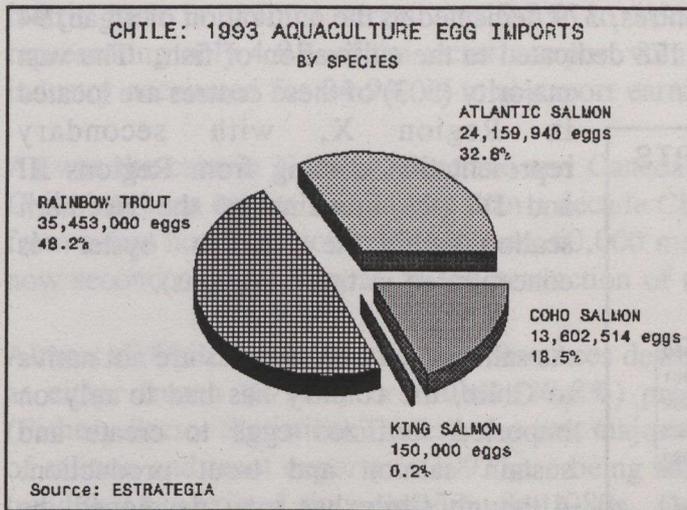
Chile's benthonic fishery faces new and difficult challenges in 1994 and beyond. Among the more noteworthy are the following:

- a. Increasing difficulty in accessing benthonic resources (especially mollusks and crustaceans). Overexploitation of benthonic species in recent years has exacerbated this particular problem.
- b. Increasing instability in the international prices of benthonic products. One consequence of this trend is a reduction in the ability of the benthonic industry to make accurate revenue forecasts year to year - a critical element in any planning process.
- c. Increasing international demands for higher quality products. Although Chile has been a beneficiary of reduced tariffs through the seven round of multilateral tariff cutting under GATT, some non-tariff barriers, such as unjustified technical standards or health regulations are being enforced across Chile's traditional export markets (e.g. Europe and North America).

Efforts are currently underway though, by members of the public and private sectors (nationally and internationally), as well as Chile's academic community, to address each of these issues. Numerous research projects are being funded by these groups that cover a wide variety of topics, including:

- a. resource life cycles;
- b. intensive and extensive aquaculture to increase raw material availability;

c. improvement of resource management measures;



d. new product development and marketing;

e. increasing the value of traditional products.

Excellent results achieved by the aquaculture industry in the cultivation of mussels, oysters, scallops, and Gracilaria (a species of algae) this past decade suggests that other benthonic species may soon become candidates for aquaculture, especially if the continued overfishing of the benthonic resources threatens future exploitation.

9. AQUACULTURE

9.1 Resources

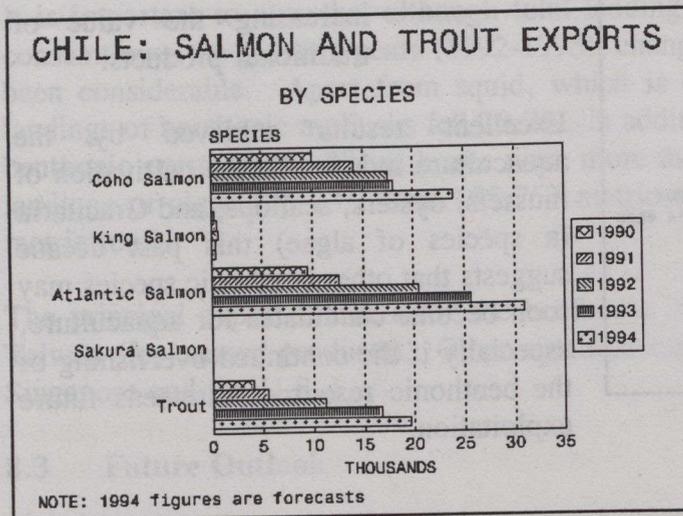
Aquaculture (fish farming) in Chile dates back to the 19th century, when in 1848 a decree was issued granting exclusive ocean fishing rights to establish hatcheries for the over exploited oyster species in the provinces of Chiloé and Valparaíso. Since the original decree 146 years ago, fish farming activities in Chile have gone well beyond just the cultivation of Chilean oysters to include Japanese oysters, mussels, scallops, salmon (Atlantic, Coho, King, and Sakura), trout and algae (Gracilaria). Recent developments in aquaculture have been characterized by the breeding of exotic species such as abalone, turbot, shrimp and sea urchins.

Without a doubt though, the farming of salmon and trout is the most important component of Chile's aquaculture industry. In 1993, salmon and trout production represented 57.4%, or 77,480 metric tons of Chile's aquaculture output (135,092 metric tons). Algae and mollusk production in comparison represented 36.1% (48,648 metric tons) and 6.6% (8,964 metric tons), respectively, of the total harvest for the year. Even more impressive is the fact that salmon and trout exports generated over US\$291 million of the fishery sector's entire export revenues for 1993. This was second only to the traditional leader, fish meal, which brought in over US\$367 million in foreign exchange in 1993.

The most striking difference between these statistics is that the total value of salmon and trout exports was based on the exportation of 60,728 metric tons of salmon and trout. The total value of fish meal exports, in comparison, was based on the exportation of 929,149 metric tons of fish meal.

At present there are more than 2,700 sectors authorized to carry out various types of fish farming in Chile, covering an area of 391,202 hectares. Spread across this vast stretch of Chilean territory are 651 different farming centres, 379 dedicated to the cultivation of algae, 94 dedicated to the cultivation of mollusks, and 178 dedicated to the cultivation of fish. The vast

majority (503) of these centres are located in Region X, with secondary representation coming from Regions III and IV (the breeding of the Northern scallop and the Pacific oyster is concentrated in these Regions).



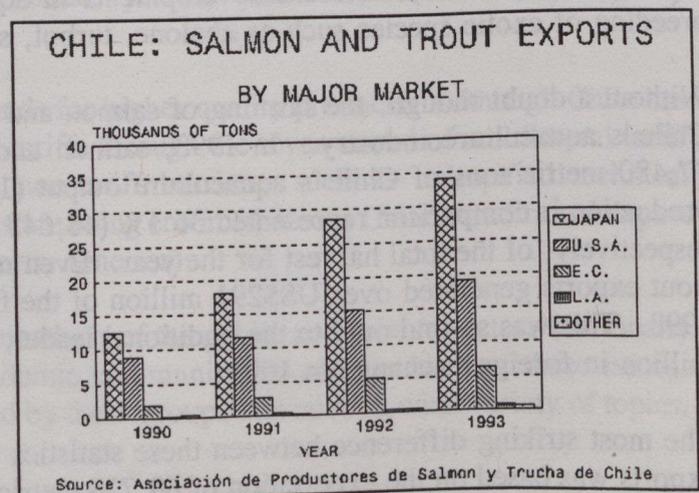
As salmon and trout species are not native to Chile, the country has had to rely on imported fertilized eggs to create and sustain salmon and trout production. Although Chile has now developed the technological expertise to produce these eggs, approximately 80% of the eggs (73,365,454 units) used in the aquaculture industry in 1993 were still imported (from

the United States, Europe, Canada and Japan). Insufficient capacity in the appropriate environment (i.e. sweet water) represents Chile's greatest hurdle in creating a completely domestic egg production system, a goal that is shared among the industry's major stakeholders. In order to enhance their international competitiveness, Chilean salmon and trout farmers want to cut their production cycles. A reduction in the reliance on imported eggs would help them realize this objective.

Investment in salmon and trout farming is currently in the order of US\$200 million. Located in Regions X to XII, fish farming now generates 8,000 jobs directly for the local economies, and another 15,000 jobs indirectly.

9.2 Performance

Among all the various sub-sectors that comprise Chile's fishing industry, aquaculture was by far and away the most prosperous in 1993. Over the period 1992 to 1993, the total harvest of salmon and trout increased 24.5% (from 62,205 metric tons to 77,480 metric tons), the total harvest of mollusks jumped 43.0% (from 6,269 metric tons to 8,964 metric tons), and the total harvest of algae rose 1.8% (from 47,807 metric tons to 48,648 metric tons).



Exports of aquacultural products in 1993 were equally impressive. From 1992 to 1993, the exportation of cultivated fish products (salmon, trout and turbot) increased 21.8% to 60,750 metric tons in volume terms and 9.9% to US\$291,757,000 in revenue terms, and while representing only 4.9% of the sector's export volume in 1993, this segment of the aquacultural industry accounted for 24.9% of total export earnings.

As was the case in Norway, Scotland and Canada, the growth of salmon and trout farming in Chile has been explosive. In less than a decade Chile's output of salmon and trout has shot up from a few hundred metric tons to over 60,000 metric tons in 1993 (dressed weight). Chile is now second only to Norway in the production of these species.

Almost all Chilean salmon and trout resources destined for export (98.2% in 1993) are processed as either frozen (67.4%) or chilled (30.8%) products. As indicated in TABLES 24 to 26 (Fishery Sector Statistical Tables), the vast majority of these products (87.0% of the total value of salmon and trout exports in 1993) are being shipped to either Japan or the United States, a trend that has existed since well into the 1980s. Depending on the market though, one will find that the mix of products shipped differs. For example, Japan is essentially the only importer of Coho salmon (in both frozen and salted forms) and frozen Rainbow trout, whereas the United States is the principal importer of chilled Atlantic salmon and chilled Rainbow trout.

Exports of cultivated algae and mollusk products in 1993 demonstrated the same sort of resiliency as what was experienced by salmon, trout and turbot. International sales of agar-agar for example, a product whose primary raw material is Gracilaria, jumped 32.6% to 1,635 metric tons in volume terms and 18.1% to US\$27,663,100 in revenue terms. Among the more notable mollusk species, exports of scallops rose an astounding 114.6% to 671 metric tons (valued at US\$6,403,500), to complement the 141.5% increase in the export of Common mussels (417 metric tons valued at US\$1,289,300).

NOTE 1: Chilean industry publications do not differentiate between exports of cultivated and wild mollusk or algae products. As such, the above export figures provided for agar-agar, scallops and the Common mussel represent sector totals.

NOTE 2: The landings and export figures for cultivated mollusk and algae species are incorporated in the results for the benthonic fishery.

To fully appreciate why Chile's aquaculture industry has performed so well over the past decade one must identify those factors that provide the industry with comparative and/or competitive advantages over its international rivals. Although this list is by no means exhaustive, there are essentially three key reasons for Chile's success in aquaculture:

1. Chile is well-suited to farming species such as salmon or trout. The far south is a maze of fjords and archipelagos fed by crystalline water from the Antarctic, and sheltered from the worst ravages of the weather. Water temperatures do not vary much from season to season so the salmon and trout grow throughout the year

and are ready for harvesting four to six months earlier than in northern countries.¹⁰

2. Chile is now the world's low cost producer of aquacultural products. In fact, Chile enjoys production costs that are at least 20% lower than those of Norway, the largest producer of aquacultured salmon in the world. Reduced production cycles have meant savings in time, wages and feed. In addition, the industry has access to a relatively cheap labour pool, and fish meal (the main ingredient in salmon feed and a substantive three-fifths of production costs) is produced domestically.
3. The Chilean Government has implemented policies that are supportive of the aquaculture industry. Instead of working at cross purposes with one another, the public and private sectors are working together to ensure Chile's aquaculture industry stays competitive well into the future.

9.3 Future Outlook

Without a doubt, the Chilean aquaculture industry is destined to play a crucial role in Chile's fishery sector for the remainder of this decade. Conservative estimates indicate that aquaculture's contribution to the sector will be around 50% by 1997. Included in this forecast would be the production and exportation of 100,000 metric tons of salmon and trout (valued at approximately US\$500 million), the production of 4,000 metric tons of scallops (valued at US\$50 million), and the continued escalation in the production of algae.

Results from the first two quarters of 1994 suggest that the industry is well on its way to realizing these targets, even sooner than anticipated. Exports of salmon and trout for example, are up 8.7% (to US\$211,444,000) in revenue terms, and up 23.6% (to 50,112 metric tons) in volume terms. The difference between the two export figures reflects a general reduction in the price of salmon on international markets.

Not surprisingly, Japan and the United States can be credited for leading this latest surge in exports. The dollar value of sales made to these markets are up 11.3% (to US\$148,615,000) and 12.6% (to US\$48,170,000), respectively, for the same six month period, year over year. A promotional campaign targeting U.S. consumers, by the Association of Salmon and Trout Producers of Chile, is undoubtedly part of the reason exports to this particular market have been so resilient. Exports of salmon and trout products to Europe though, are down 30.0% in revenue terms (to US\$10,611,000) and 17.5% in volume terms (2,600 metric tons), largely reflecting an economic slowdown that is still evident in many of the western European countries.

¹⁰Source: Chile Inc. Sourcebook 1994.

Assuming the longer term forecasts for the aquaculture industry are accurate, the immediate challenge for the sector is to find a home for the 100,000 metric tons of fish that will be tumbling out of Chile's processing plants over the next few years. Producers have a firm foothold in the Japanese and United States markets and are making inroads in Europe. There just may not be room for everyone, however. World output of Salmon is climbing steadily as Norway and Scotland get back on their feet and new contenders like Australia enter the picture. Demand is growing but not at the same rate, and protectionism could restrict or even close markets overnight.¹¹

Given these competitive realities, the future of the Chilean aquaculture industry and its chances of flourishing as anticipated will depend on a number of factors. Included in this list would be the following:

- a. the industry's ability to keep costs down;
- b. the need for expanded marketing activities in the industry's traditional and non-traditional export markets;
- c. continued diversification into new species;
- d. continued emphasis in research and development, particularly in the areas of genetic selection and reproduction techniques;
- e. maintenance of a high quality environment in which to develop the various aquaculture species.

The last point in this list is particularly relevant to how the industry is able to control for viral diseases in the fish stocks as production levels increase. Many northern hemisphere producers have collapsed in recent years, largely because production escalated beyond control, sending prices plummeting and triggering off rampant fish disease and soaring costs.

The spread of viral diseases, a nightmare for salmon farmers because of the devastating cost in treatment and mortality, has so far been prevented in Chile thanks to timely regulations prohibiting the importation of uncertified eggs. Although parasites, bacteria and fungi cost farms millions of dollars every year, health problems have not yet forced them out of business, and they are involved in research to ensure this never happens.¹²

¹¹Source: Chile Inc. Sourcebook 1994.

¹²Source: Chile Inc. Sourcebook 1994.

10. OPPORTUNITIES FOR CANADA IN CHILE'S FISHERY SECTOR

The Canadian fish, marine plants, and seafood industry has a highly diversified resource of shellfish, pelagics and groundfish, and is well regarded globally for producing and exporting a variety of top-quality, pollution-free products. In fact, during the mid-1980s, Canada was the world's largest exporter of fish and seafood products in terms of value.

Over the past decade though, the industry (particularly in the Atlantic provinces and Quebec) has had to deal with a major reduction in groundfish quotas, as well as a worldwide economy that is just emerging out of an economic slowdown that has lasted for close to four years. As a result of these factors, the Canadian fishery sector has been forced to look beyond its traditional operations and markets, and pursue opportunities throughout the globe - opportunities that will help sustain the industry well into the 21st century.

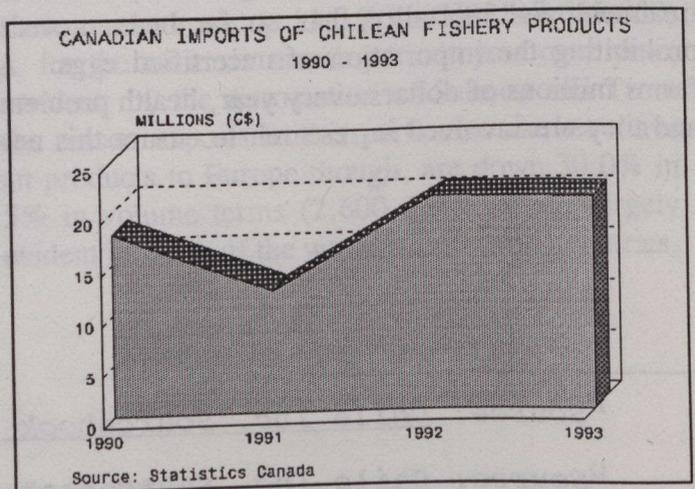
As a market, the Chilean fishery sector affords Canada various opportunities, but the core of them (at least at this point in time) are very specific or niche oriented. The primary reason behind this is that the nature and development of the two country's industries have differed. The Canadian fishing industry, for example, has historically been a harvester, processor and exporter of Canadian fish and seafood resources (i.e. groundfish, such as cod on the east coast, and salmon, herring and halibut on the west coast). Chile's fishing industry, in comparison, has focused on the production and export of fish meal, relying heavily on the mackerel, anchovy and sardine resources that are spread throughout the territorial waters of Chile.

While it is true both nations share a common and growing interest in fish farming, the opportunities for Canadian business in Chile's industry can again be characterized as being somewhat limited to very specific commercial ventures. As previously explained, Chile is now second only to Norway in the production of farmed salmon and trout, and they are well situated to eventually take over the number one position. Given these circumstances, Canadian business must be realistic about where and in what role they can play in this burgeoning industry.

The remainder of this section will be devoted to specifically identifying those commercial opportunities that currently exist for Canada in Chile's fishery sector.

10.1 Export of Canadian Goods

According to Statistics Canada records, Canada imported in excess of C\$41,000,000 worth of Chilean fishery products over the past two years (C\$20,995,000 in 1992 and C\$20,668,000 in 1993). Beyond the limited export of eggs for the use in Chile's aquaculture



industry though, Canada has essentially been a non-player in Chile's fishery sector. It is possible that a percentage of the industrial equipment and supplies that Canada has been exporting to Chile over the past few years was destined for the fishery sector, but unfortunately, Statistics Canada was not able to confirm or refute this claim.

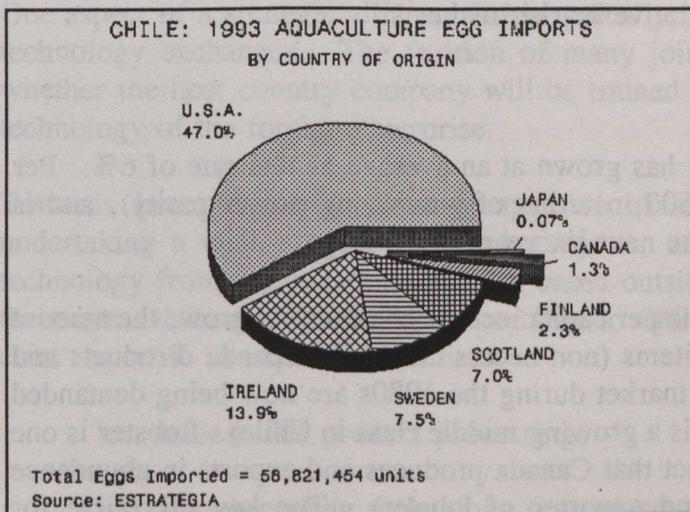
With respect to the export of Canadian products into Chile, the opportunities appear to be quite diverse, as indicated below:

10.1.1 Fishing and Aquacultural Equipment

In July, 1994, a Canadian mission from Quebec, representing a number of companies in various industries, visited Chile to investigate export opportunities for their companies' various goods and services. Not necessarily expecting to sell any products at this time, one of the mission delegates, who was representing a manufacturer of floating aluminum dock structures and polyethylene flotation systems, was able to arrange for the sale of a number of aluminum fish cages to a Chilean company operating in the aquaculture industry.

Another indication that export opportunities do in fact exist in Chile for Canadian manufacturers of fishing equipment was made apparent during a September, 1994, visit to the Canadian Embassy by a representative of a Chilean distributor of industrial products and equipment. The representative was interested in contacting Canadian companies that manufacture multifibre, nylon fish nets, with and without knots, as well as locating Canadian companies that sell industrial fish hooks that can be attached to a certain variety of fish net. Although the Japanese already are meeting some of the industry's demands for these products, the distributor suggested that there is still a lot of room for the entry of other suppliers.

These are but two examples of the type of Canadian fishing equipment that could be exported from Canada to Chile. Without a doubt though, the potential exceeds what has been identified in this report. To fully exploit this particular export opportunity, communication between Canadian fishing equipment manufacturers and Chilean fishing companies must develop. It is only through this process that specific market needs will be identified, and filled.



10.1.2 Fertilized Fish Eggs

In 1993, Canada exported 970,000 fish eggs to Chile, or 1.3% of what Chile's aquacultural industry imported for the entire year. Considering Canada was instrumental in the development of fish farming in Chile and is currently among the global leaders in aquacultural research and development, this level of exportation seems excessively low.

According to Dr. John Anderson of the Atlantic Salmon Federation, Canada is now producing salmon and trout eggs with the highest levels of genetic quality, something that Chile's aquacultural industry is actively pursuing. It is important to note though, that a market for these eggs in Chile is not guaranteed. The eggs that Dr. Anderson is referring to are being developed off the coastal waters of New Brunswick, an area with its own unique set of environmental characteristics. How the eggs react and develop in Chilean waters may be entirely different from what has been occurring in Canada. Consequently, research must be completed in this area (i.e. whether the eggs that are being produced in Canada will sustain their superior genetic qualities in Chilean waters) before this particular export opportunity can be realized.

10.1.3 Vaccines and Diagnostics

The spread of viral diseases, a nightmare for salmon and trout farmers because of the devastating cost in treatment and mortality, has so far been prevented in Chile thanks to timely regulations prohibiting the importation of uncertified eggs. Unfortunately, infections and disease caused by bacteria, parasites and fungi have not alluded Chile's fish farms, and have subsequently cost the aquaculture industry millions of dollars year after year.

Canadian companies involved in the manufacturing and sale of bacterial and viral vaccines, and diagnostics specific to the aquacultural industry, are in a unique position to play an active role in reducing and preventing future disease and health problems in Chile's aquacultural industry. Canada not only has a rich history in dealing with diseases inherent to the sub-sector, but Canadian bio-technology companies are recognized as world leaders in the development of aquacultural bacterins, vaccines and diagnostic kits.

Two Canadian companies, Aqua Health Ltd. and Micrologix International Ltd., have already started to capitalize on this particular market opportunity. Aqua Health for example, is having considerable success selling its various lines of bacterins in Chile. Micrologix has met with comparable export success with its diagnostic kits. Although neither company has yet been able to market a viral vaccine that meets the particular needs of Chile's aquacultural industry, both Aqua Health and Micrologix are devoting significant time and resources towards developing such products, in what promises to be quite a lucrative market niche.

10.1.4 Lobster

Over the past 10 years the Chilean economy has grown at an average annual rate of 6%. Per capita income is now US\$3,300 (or US\$4,500 in terms of purchasing power parity), and is expected to increase by another 50% over the next six years.

As the Chilean economy, and subsequently the per capita income continues to grow, the amount of disposable income available for 'luxury' items (non-necessities) will expand. Products and services that would have had a very limited market during the 1980s are now being demanded across a wider base of consumers (i.e. there is a growing middle class in Chile). Lobster is one example of this type of product, but a product that Canada produces and exports in abundance (Canada is the world's largest producer and exporter of lobster). The key of course for

Canadian exporters of Lobster is to establish a presence in Chile before the market is locked up by the United States, Australia, Cuba, or a host of other countries that share a capacity to export this particular shellfish.

10.2 Strategic Alliances

10.2.1 Joint Ventures

In February 1993, the FCC (Fisheries Council of Canada) and CIDA (Canadian International Development Agency) entered into an agreement to cover a 20-month period to August 31, 1994 to foster mutually beneficial strategic alliances between the Canadian fishing industry and the industry in Latin America and South America. Fifteen Canadian companies undertook strategic alliance investigative projects during this period, with five of them having some sort of interaction with the Chilean fishing industry.

One of the five companies, Laurence Sweeney Fisheries Ltd., of Halifax, Nova Scotia, was particularly successful in capitalizing upon its newly developed relationship with the Chilean industry. After completing its FCC/CIDA Starter Study project, the company imported a container of scallops from Chile (valued at \$C250,000) to supplement the company's export to the United States. Laurence Sweeney Fisheries Ltd. is continuing discussions with the Chilean company for additional supplies for export to the United States and for value-added production in Canada.

Although this specific FCC/CIDA program has just recently concluded, and the Laurence Sweeney Fisheries Ltd. example is but one of the program's many success stories, what is important to remember is that strategic alliance/joint venture opportunities do exist between Canadian and Chilean companies involved in the fishing industry and that those that have been established are proving to be mutually beneficial and profitable.

10.2.2 Transfer of Technology

One aspect of a strategic alliance that is typically important to both parties is the potential for technology exchanges. The fruition of many joint ventures are in fact often dependent on whether the host country company will be trained in, or have access to a specific proprietary technology of the foreign enterprise.

Towards becoming even more competitive as an industry, the Chilean fishery sector is undertaking a wide range of research projects, many of which are based on the transfer of technology from organizations that are based outside of Chile's borders. Currently, there are three areas that are of particular importance to Chile's fishing industry, and Canada has world-class expertise in each of them:

- i. value-added product processing;
- ii. post-processing technology (e.g. wastewater treatment);

iii. systems for controlling/preventing aquacultural diseases.

The question of course is whether Canadian companies want to enter into agreements that force them to transfer technology to Chilean partners, not only because it suddenly creates a competitor of comparable or superior abilities (as was the case with salmon farming), but the opportunities for export to, or investment in the country may be more lucrative over the long term.

It is worth noting that the Canadian Centre for International Fisheries Training and Development (CCIFTD) at Memorial University in St. John's, Newfoundland is currently working with Universidad Austral in Valdivia to identify possible areas of technology transfer between Newfoundland and Chile. To date, the focus of the relationship has been on how Chile's artisanal fishermen can better manage and exploit the five mile zone over which they have exclusive fishing rights. Towards realizing these objectives, it has been proposed that Newfoundland supply three or four multipurpose vessels (under 50 metres in length) to Chile, on a trial basis.

The immediate benefits for both partners are significant. Newfoundland is able to showcase and market some of their vessels, fishing gear, and technical acumen - assets that are not being fully utilized in Canada at the moment - to the Chilean fishery sector. From Chile's perspective, a cross-section of artisanal fisherman will receive state-of-the-art training in how to better identify, exploit, and manage the fish stocks in the five mile zone, as well as gain exposure to more technologically advanced fishing vessels and equipment.

The longer term commercial benefits of this particular project, from Canada's perspective, are not as transparent. The Chilean artisanal fishing complex, while representing a fleet of over 7,000 vessels and several thousand fishermen, is not cash rich. If future trade opportunities start to develop as anticipated, the question then becomes one of financing (i.e. who will and can pay for any products or services exported from Canada to Chile's artisanal fishermen).

10.3 Export of Canadian Services

Each one of the opportunities identified in the 'Transfer of Technology' section can feasibly be repackaged as a consulting opportunity for Canadian firms. Canada's experience in value-added product processing, environmental management (including wastewater treatment), coastal zone management, and aquacultural disease control is second to none, and subsequently affords Canadian companies the chance to export their knowledge and expertise to the Chilean fishery sector.

There is, in fact, already some evidence of this occurring in Chile. ADI, an environmental management consulting firm based out of New Brunswick, and who just recently formed a joint venture with CICA (a Chilean consulting firm), is working on a pilot project for a company with fishing processing facilities in northern Chile.

Utilizing equipment that was specifically shipped from Canada, CICA - ADI International S.A. (the name of the joint venture company) is trying to help the Chilean fish processing plant dispose of its wastewater in a manner that is not harmful to the marine environment surrounding the processing plant. According to Mr. Chris Beggs, General Manager of CICA - ADI international S.A., initial results are very encouraging and point toward a successful completion of the pilot project - an essential ingredient in securing future contract work with this and other Chilean companies.

With Chile's fishery sector becoming increasingly conscious of how it disposes of its wastewater, and with the aquacultural industry bracing for a substantial jump in the harvesting and processing of farmed salmon and trout, consulting opportunities, such as the one being enjoyed by CICA - ADI International S.A., are undoubtedly on the upswing.

10.4 Direct Foreign Investment

The next level of participation in Chile's fishery sector by Canadian businesses, following exporting or strategic alliances would be in the form of direct foreign investment. Although more risky, and requiring a greater degree of financial and human resource commitment, this type of investment brings with it greater operational control, and guarantees exclusivity over any company specific technology.

As outlined in the section titled Investment, there has been a consistent, albeit modest inflow of foreign monies into the Chilean fishing industry since the 1970s. The time may never have been better though, to increase this level of investment and take advantage of some of the structural changes that are occurring in the fishery sector. Much of the \$US600 million that is proposedly to be invested in the industry over the next five years will undoubtedly be directed towards the construction of state-of-the-art processing plants. This will significantly increase the value-added production capabilities of the Chilean fishing industry, particularly of high-value species such as salmon or trout.

10.5 Value-added Processing in Canada

Canadian fisheries are currently suffering from a significant problem of overcapacity in the fish processing sector. According to the Department of Supply and Services Canada, the 658 plants in the Atlantic fisheries and 125 plants on the Pacific coast were operating at less than 50% capacity in 1993. Rationalization and restructuring of the sector definitely represents one solution for ensuring the industry's long term viability, but the sector must also be proactive in identifying new and innovative ways of utilizing the unproductive capacity - not only because it makes the plants more efficient and profitable, but it ensures that a higher level of employment will be sustained within the Canadian fishing industry.

The Chilean fishery sector is attempting to diversify into greater value-added production, so as not to be so vulnerable to the economic swings that are inherent in the fish meal industry. Considering the vast majority of this value-added production would be destined for export, and to a large extent, the United States, the marriage between Chile's demand for appropriate

processing facilities and Canada's abundant supply of fish processing plants seems entirely plausible. The possibility of such projects manifesting themselves though, is of course dependent on their overall cost and profit structures, as well as their logistical feasibility (e.g. chilled Atlantic salmon destined for the United States would not be sent to Canada first for processing and subsequently exported to the U.S.).

Again, one merely has to look at the Laurence Sweeney Fisheries Ltd. example to realize that processing Chilean fish resources in Canada for subsequent export to another market (such as the United States) is not an unreasonable proposition.

TABLE 3

CHILE: 1990 - 1993 COMMERCIAL FISH LANDINGS, BY SPECIES

(Metric tons)

FISH SPECIES	1990	1991	1992	1993	% CHANGE 1993/1992
Adelphi	11	4	3	2	-33.3
Albacore	1915	2035	2370	2383	-0.5
Anchoa	143,188	198,114	1,282,303	1,471,923	14.8
Anguilla	891	1,134	481	157	-68.0
Arctifilago	185	25	11	17	54.5
Atun Austral	7	48	14	82	485.7
Atun Atl. Longfin	308	150	18	19	5.6
Atun Atl. Shortfin	4	28	12	21	75.0
Atun Black	4	212	173	237	35.8
Merluccia	4,134	4,134	12,087	-	100.0
Atun S. L. Fin	28	73	31	43	41.9
Branco	2,337	3,033	30,827	32,004	3.6
Dorado	-	-	171	302	76.6
Branco	28	481	276	343	23.5
Branco	27	138	308	388	25.6
Branco	2,493	2,387	2,576	2,906	12.8
Branco	10,227	10,784	21,104	26,073	23.7
Branco	-	-	25	181	624.0
Branco	-	-	-	130	-
Branco	-	-	-	148	-
Branco	-	-	-	1,044	-
Branco	-	1,111	1,282	1,481	15.5
Branco	10,227	1,077	481	4,513	33.4
Branco	-	-	-	1,023	-
Branco	-	-	-	2,124	-
Branco	-	-	173	374	116.2
Branco	-	-	128	194	50.8
Branco	1,477,774	1,477,774	1,477,774	1,477,774	0.0
Branco	-	-	274	726	162.8
Branco	-	-	139	486	248.9
Branco	-	-	1,321	1,131	-13.6
Branco	488	1,118	387	381	-1.5
Branco	20,308	21,700	22,014	24,267	10.2
Branco	1,084	1,084	2,140	21,003	886.3
Branco	194,022	164,027	214,024	22,482	-89.3
Branco	22,112	49,213	38,127	55,117	44.6
Branco	113	24	140	228	63.6
Branco	2,050	2,204	2,275	2,416	6.2
Branco	219	207	48	62	29.0
Branco	1,111	1,079	180	341	89.4
Branco	14	2	20	28	40.0
Branco	1,287	1,173	1,124	1,201	6.9
Branco	619	610	610	782	28.0
Branco	44	33	13	28	115.4
Branco	11	93	28	-	-
Branco	2,494	14,037	12,111	15,182	25.5
Branco	13,438	17,264	11,182	13,187	18.8
Branco	389	1,038	307	250	-17.8
Branco	283,797	284,914	282,212	284,124	0.7
Branco	202,275	204,227	204,212	204,124	-0.0
Branco	144	182	381	437	14.4
Branco	1,024	97	48	308	532.1
Branco	2,481	2,490	1,212	18,122	1493.1
Branco	-	2	20	24	20.0
Branco	15,120	4,127	3,071	2,201	-28.0
TOTAL	5,611,170	5,611,170	5,611,170	5,611,170	0.0

**FISHERY SECTOR
STATISTICAL
TABLES**

TABLE 1

CHILE: 1990 - 1993 COMMERCIAL FISH LANDINGS, BY SPECIES

(metric tons)

FISH SPECIES	1990	1991	1992	1993	% CHANGE 1993/1992
Acha	11	4	3	2	-33.3
Albacora/Swordfish	4,955	7,255	6,379	4,712	-26.1
Anchoa/Anchovy	845,169	936,114	1,287,303	1,472,929	14.4
Anguila/Eel	861	1,111	491	157	-68.0
Apanado/Sea Bass	100	28	11	17	54.5
Atun Amarilla/Yellowfin Tuna	2	40	14	82	485.7
Atun Aleta Larga/Albacore	306	170	18	19	5.6
Ayanque/White Sea Bass	23	20	12	21	75.0
Azulejo/Shark	4	212	175	237	35.4
Bacaladillo	-	4,154	12,587	-	N/A
Bacalao de J. Fernandez/Codfish	79	73	51	42	-17.6
Bacalao Profundidad/Sea Bass	9,387	10,969	30,828	22,008	-28.6
Besugo	-	-	579	862	48.9
Blanquillo/Tilefish	396	683	576	383	-33.5
Bonito/Pacific Bonito	109	159	233	288	23.6
Brotula	5,402	2,367	4,578	2,908	-36.5
Caballa/Pacific Mackerel	192,948	191,723	72,364	96,023	32.7
Cabinza/Grunt	500	757	338	161	-52.4
Cabrilla/Rock Fish	1,109	1,326	570	330	-42.1
Chancharro	581	135	90	146	62.2
Cojinoba/Black Ruff	7,515	4,339	2,659	4,944	85.9
Congrio Colorado/Red Ling	1,323	1,111	1,203	1,411	17.3
Congrio Dorado/Golden King Ling	13,203	9,577	6,483	4,643	-28.4
Congrio Negro/Black Ling	6,991	5,989	1,908	2,023	6.0
Corvina/Grunt	1,828	1,989	1,995	2,150	7.8
Dorado/Common Dolphin Fish	743	350	173	374	116.2
Huaiquil	-	-	109	104	-4.6
Jurel/Jack Mackerel	2,471,875	3,020,512	3,212,060	3,236,244	0.8
Lenguado/Flounder	821	600	574	726	26.5
Lisa/Mullet	929	617	619	496	-19.9
Machuelo Tritre/Herring	1,117	1,250	1,883	1,553	-17.5
Marrajo/Shark	893	1,118	707	581	-17.8
Merluza Comun/Pacific Silver Hake	52,820	63,903	62,644	64,262	2.6
Merluza de 3 Aletas/Hake	3,931	2,609	5,149	27,607	436.2
Merluza de Cola/Hake	128,002	164,697	214,324	82,580	-61.5
Merluza del Sur/Hake	52,112	40,221	38,127	20,117	-47.2
Palometa	115	96	246	239	-2.8
Pejegallos/Elephant Fish	2,900	3,264	4,729	2,516	-46.8
Pejeperro/Lorasses or Sheephead	439	207	40	62	55.0
Pejerrey de Mar/Silverside	5,532	1,079	750	341	-54.5
Puye/Angula	14	2	20	38	90.0
Raya/Skate	1,317	1,171	1,239	1,971	59.1
Robalo/Rock Cod	610	610	820	782	-4.6
Roncacho/Drum	34	35	21	38	81.0
Salmon Cereza/Cherry Salmon	29	105	68	-	N/A
Salmon Atlantico/Atlantic Salmon	9,498	14,957	23,715	29,182	23.1
Salmon Plateado/Pacific Salmon	13,426	17,966	22,182	25,177	13.5
Salmon Rey/King Salmon	389	1,059	667	859	28.8
Sardina Comun/So. Pacific Herring	285,757	564,914	452,012	244,125	-46.0
Sardina/So. Pacific Sardine	900,275	734,448	808,838	481,161	-40.5
Sierra/Snake Mackerel	144	158	582	427	-26.6
Tollo/Smoothhound	1,026	937	481	398	-17.3
Trucha Arcoiris/Rainbow Trout	5,481	8,393	15,515	22,257	43.5
Turbot	-	3	20	34	70.0
Other fish	10,150	4,139	3,976	2,801	-29.6
TOTAL	5,043,170	5,829,724	6,303,609	5,863,550	-7.0

Source: Anuario Estadístico de Pesca 1993, SERNAP.

TABLE 2
1990 - 1993 COMMERCIAL MOLLUSK LANDINGS, BY SPECIES
 (metric tons)

MOLLUSK SPECIES	1990	1991	1992	1993	% CHANGE 1993/1992
Almeja/Clam	24,089	36,591	34,792	23,068	-33.7
Calamar/Squid	20	4,074	68	162	138.2
Caracol Locate/Snail	2,625	1,692	2,889	1,724	-40.3
Caracol Palo Palo/Snail	523	837	599	351	-41.4
Caracol Picuyo/Snail	-	-	12	37	108.3
Caracol Piquilhue/Snail	110	168	461	129	-72.0
Caracol Rubio/Snail	24	345	872	350	-59.9
Caracol Tegula/Snail	149	63	176	85	-51.7
Caracol Trophon/Snail	228	579	446	230	-48.4
Caracol Trumulco/Snail	417	426	529	385	-27.2
Chiton	6	482	579	273	-52.8
Chocha	2	96	85	52	-38.8
Cholga/Blue Mussel	7,090	5,423	7,544	7,662	1.6
Chorito/Mussel	10,854	8,532	10,993	9,792	-10.9
Choro/Giant Mussel	1,514	1,632	1,760	1,366	-22.4
Culengue/Clam	31,372	27,859	26,033	13,820	-46.9
Heupo	4,434	8,617	7,639	5,787	-24.2
Jibia/Giant Skid	-	445	9,400	7,442	-20.8
Lapa/Snail	3,688	3,711	3,921	6,034	53.9
Loco/Chilean Abalone	227	218	5	8,574	1713.8
Macha/Razor Clam	9,397	9,612	11,832	8,274	-30.1
Navajuela/Razor Clam	2,714	4,637	4,733	2,609	-44.9
Ostion del Norte/Scallop	1,182	1,165	2,113	4,683	121.6
Ostion del Sur/Scallop	912	1,050	864	1,332	54.2
Ostra Chilena/Oyster	221	443	206	698	238.8
Ostra Pacifico/Pacific Oyster	144	371	123	435	253.7
Pota	-	-	2,415	841	-65.2
Pulpo/Octopus	2,652	2,438	3,286	3,608	9.8
Other Mollusks	1,124	588	234	33	-85.9
TOTAL	105,718	122,094	134,609	109,836	-18.4

Source: Anuario Estadístico de Pesca 1993, SERNAP

TABLE 3

CHILE: 1990 - 1993 COMMERCIAL CRUSTACEAN LANDINGS, BY SPECIES

(metric tons)

CRUSTACEAN SPECIES	1990	1991	1992	1993	% CHANGE 1993/1992
Camaron Nailon/Pandalid Shrimp	6,626	7,571	8,224	8,237	0.2
Centolla/King Crab	1,834	2,613	1,571	1,980	26.0
Centollon/Snow Crab	1,865	3,419	1,326	955	-28.0
Jaiba/Crab	3,720	3,144	3,616	4,949	36.9
Krill	4,527	3,679	6,066	3,261	-46.2
Langosta J. Fernandez/Rock Lobster	19	27	12	30	150.0
Langostino Amarillo/Munida Shrimp	5,796	6,934	3,736	2,224	-40.5
Langostino Colorado/Munida Shrimp	-	346	4,002	3,334	-16.7
Picoroco/Giant Barnacle	2,268	900	1,488	1,192	-19.9
Other Crustaceans	58	38	172	38	-77.9
TOTAL	26,713	28,671	30,213	26,200	-13.3

CHILE: 1990 - 1993 COMMERCIAL ALGAE LANDINGS, BY SPECIES

(metric tons)

ALGAE SPECIES	1990	1991	1992	1993	% CHANGE 1993/1992
Anhfeltia	-	25	-	-	N/A
Chasca/Gelidium	938	1,644	1,606	1,569	-2.3
Chascon/Lessonia	80,885	40,866	49,377	70,565	42.9
Chicorea de Mar/Gigartina	15,169	11,981	3,748	4,163	11.1
Cochayuyo/Durvillea	1,296	703	1,023	1,749	71.0
Huiro/Kelp	8,724	7,578	7,021	4,580	-34.8
Luche	-	-	73	181	147.9
Luga-Luga/Iridea	46,338	27,706	9,325	19,513	109.3
Pelillo/Gracilaria	75,050	69,083	54,393	53,437	-1.8
TOTAL	228,861	159,586	126,566	155,757	23.1

CHILE: 1990 - 1993 EQUINODERM LANDINGS, BY SPECIES

(metric tons)

EQUINODERM SPECIES	1990	1991	1992	1993	% CHANGE 1993/1992
Erizo/Sea Urchin	15,648	21,382	29,197	31,300	7.2
Lobo Marino Comun	176	56	-	-	N/A
Pepino de Mar/Sea Cucumbers	-	1,601	237	13	-9.5
Piure	3,961	2,967	3,934	3,992	1.5
TOTAL	19,785	26,006	33,368	35,305	5.8

Source: Anuario Estadístico de Pesca 1993, SERNAP.

TABLE 4

**CHILE: 1993 TOTAL LANDINGS
BY SPECIES AND REGION**
(metric tons)

REGION	ALGAE	FISH	MOLLUSKS	CRUSTACEANS	OTHER SPECIES	TOTAL
I	-	1,469,259	6,431	46	81	1,475,817
II	14,113	545,788	6,101	44	1,189	567,235
III	62,202	185,950	4,465	2,266	675	255,558
IV	6,605	80,935	11,975	3,464	1,386	104,365
V	6	274,209	3,279	4,191	282	281,967
VI	4,507	734	284	22	95	5,642
VII	612	6,855	2,567	461	1,050	11,545
VIII	15,932	3,126,294	8,090	5,981	1,455	3,157,752
IX	-	1,923	452	-	-	2,375
X	51,523	79,544	54,068	3,580	17,902	206,617
XI	221	15,396	4,045	614	1,631	21,907
XII	36	2,059	6,791	2,247	9,559	20,692
RM	-	1,102	-	-	-	1,102
BF	-	60,142	447	-	-	60,589
AI	-	13,360	841	3,284	-	17,485
TOTAL	155,757	5,863,550	109,836	26,200	35,305	6,190,648

Source: Anuario Estadístico de Pesca 1993, SERNAP.

TABLE 5

**CHILE: 1993 TOTAL LANDINGS
BY SPECIES AND MONTH**
(metric tons)

MONTH	ALGAE	FISH	MOLLUSKS	CRUSTACEANS	OTHER SPECIES	TOTAL
January	15,493	468,350	9,048	1,179	534	494,604
February	17,875	568,823	8,370	1,441	1,362	597,871
March	16,602	654,688	11,356	4,895	2,343	689,884
April	14,241	682,490	9,140	2,000	2,900	710,771
May	11,484	477,198	8,991	1,663	4,139	503,475
June	11,254	535,194	7,999	2,085	4,323	560,855
July	11,326	560,518	10,185	2,374	3,434	587,837
August	10,260	511,876	6,118	2,372	3,437	534,063
September	9,457	272,012	7,802	2,692	6,139	298,102
October	12,749	325,291	9,910	1,773	4,160	353,883
November	9,977	418,423	10,965	1,979	1,464	442,808
December	15,039	388,687	9,952	1,747	1,070	416,495
TOTAL	155,757	5,863,550	109,836	26,200	35,305	6,190,648

Source: Anuario Estadístico de Pesca 1993, SERNAP.

TABLE 6

**CHILE: 1993 INDUSTRIAL LANDINGS
BY SPECIES AND REGION**
(metric tons)

REGION	FISH	MOLLUSKS	CRUSTACEANS	TOTAL	% OF TOTAL
I	1,415,563	-	3	1,415,566	26.8
II	499,084	-	-	499,084	9.5
III	142,444	-	2,204	144,648	2.7
IV	74,415	-	3,197	77,612	1.5
V	255,006	98	4,047	259,151	4.9
VI	-	-	-	-	0.0
VII	301	-	-	301	0.0
VIII	2,863,619	9	4,352	2,867,980	54.4
IX	-	-	-	-	0.0
X	2,390	-	619	3,009	0.1
XI	8,929	2	-	8,931	0.2
XII	19	-	-	19	0.0
TOTAL	5,261,770	109	14,422	5,276,301	100.0

Source: Anuario Estadístico de Pesca 1993, SERNAP.

TABLE 7

**CHILE: 1993 INDUSTRIAL LANDINGS
BY SPECIES AND MONTH**
(metric tons)

MONTH	FISH	MOLLUSKS	CRUSTACEANS	TOTAL	% OF TOTAL
January	377,332	22	783	378,137	7.2
February	490,623	55	827	491,505	9.3
March	600,283	13	1,634	601,930	11.4
April	633,409	2	621	634,032	12.0
May	441,782	-	967	442,749	8.4
June	506,557	2	1,379	507,938	9.6
July	525,948	1	1,760	527,709	10.0
August	481,469	12	1,743	483,224	9.2
September	240,834	-	1,969	242,803	4.6
October	298,663	2	874	299,539	5.7
November	362,920	-	907	363,827	6.9
December	301,950	-	958	302,908	5.7
TOTAL	5,261,770	109	14,422	5,276,301	100.0

Source: Anuario Estadístico de Pesca 1993, SERNAP.

TABLE 8

**CHILE: 1993 ARTISANAL LANDINGS
BY SPECIES AND REGION**
(metric tons)

REGION	FISH	MOLLUSKS	CRUSTACEANS	OTHER SPECIES	TOTAL	% OF TOTAL
I	53,696	6,372	43	81	60,192	10.1
II	46,704	6,022	44	1,189	53,959	9.1
III	43,506	1,540	62	675	45,783	7.7
IV	6,486	10,326	267	1,386	18,465	3.1
V	19,167	3,139	144	282	22,732	3.8
VI	734	284	22	95	1,135	0.2
VII	6,455	2,567	461	1,050	10,533	1.8
VIII	262,641	8,081	1,629	1,455	273,806	46.1
IX	1,889	202	-	-	2,091	0.4
X	7,871	50,108	2,961	17,902	78,842	13.3
XI	658	4,043	614	1,631	6,946	1.2
XII	991	6,791	2,247	9,559	19,588	3.3
TOTAL	450,798	99,475	8,494	35,305	594,072	100.0

Source: Anuario Estadístico de Pesca 1993, SERNAP.

TABLE 9

**CHILE: 1993 ARTISANAL LANDINGS
BY SPECIES AND MONTH**
(metric tons)

MONTH	FISH	MOLLUSKS	CRUSTACEANS	OTHER SPECIES	TOTAL	% OF TOTAL
January	73,337	8,601	396	534	82868	13.9
February	60,601	7,858	614	1,362	70435	11.9
March	43,793	10,381	707	2,343	57224	9.6
April	41,589	8,034	663	2,900	53186	9.0
May	28,318	8,082	682	4,139	41221	6.9
June	18,308	7,407	706	4,323	30744	5.2
July	20,111	9,273	614	3,434	33432	5.6
August	15,111	5,440	629	3,437	24617	4.1
September	17,562	7,018	723	6,139	31442	5.3
October	12,890	8,730	899	4,160	26679	4.5
November	43,896	9,606	1,072	1,464	56038	9.4
December	75,282	9,045	789	1,070	86186	14.5
TOTAL	450,798	99,475	8,494	35,305	594072	100.0

Source: Anuario Estadístico de Pesca 1993, SERNAP.

TABLE 10

**CHILE: 1993 FACTORY VESSEL CAPTURE
BY SPECIES AND MONTH
(metric tons)**

MONTH	FISH	MOLLUSKS	TOTAL	% OF TOTAL
January	1,184	6	1,190	2.0
February	1,284	4	1,288	2.1
March	646	-	646	1.1
April	1,766	-	1,766	2.9
May	2,285	-	2,285	3.8
June	5,478	1	5,479	9.0
July	10,151	61	10,212	16.9
August	11,379	210	11,589	19.1
September	9,586	-	9,586	15.8
October	8,755	-	8,755	14.4
November	5,939	164	6,103	10.1
December	1,689	1	1,690	2.8
TOTAL	60,142	447	60,589	100.0

Source: Anuario Estadístico de Pesca 1993, SERNAP.

TABLE 11

**CHILE: 1993 ALGAE CAPTURE
BY MONTH
(metric tons)**

MONTH	TOTAL	% OF TOTAL
January	11,607	10.8
February	14,100	13.2
March	13,125	12.3
April	11,523	10.8
May	7,823	7.3
June	6,717	6.3
July	5,976	5.6
August	5,334	5.0
September	5,203	4.9
October	6,980	6.5
November	6,738	6.3
December	11,983	11.2
TOTAL	107,109	100.0

Source: Anuario Estadístico de Pesca 1993, SERNAP.

TABLE 12

**CHILE: 1993 AQUACULTURAL HARVEST
BY SPECIES AND REGION**
(metric tons)

REGION	FISH	MOLLUSKS	ALGAE	TOTAL	% OF TOTAL
I	-	59	-	59	0.0
II	-	79	60	139	0.1
III	-	2,925	4,540	7,465	5.5
IV	34	1,649	1,885	3,568	2.6
V	36	42	4	82	0.1
VI	-	-	-	-	0.0
VII	99	-	-	99	0.1
VIII	34	-	814	848	0.6
IX	34	250	-	284	0.2
X	69,283	3,960	41,435	114,588	84.8
XI	5,809	-	-	5,809	4.3
XII	1,049	-	-	1,049	0.8
RM	1,102	-	-	1,102	0.8
TOTAL	77,480	8,964	48,648	135,092	100.0

Source: Anuario Estadístico de Pesca 1993, SERNAP.

TABLE 13

**CHILE: 1993 AQUACULTURAL HARVEST
BY SPECIES AND MONTH**
(metric tons)

MONTH	FISH	MOLLUSKS	ALGAE	TOTAL	% OF TOTAL
January	13,887	419	3,886	18,192	13.5
February	15,597	453	3,775	19,825	14.7
March	9,144	962	3,477	13,583	10.1
April	4,074	614	2,718	7,406	5.5
May	3,214	558	3,661	7,433	5.5
June	3,049	589	4,537	8,175	6.1
July	2,991	850	5,350	9,191	6.8
August	3,207	456	4,926	8,589	6.4
September	3,389	784	4,254	8,427	6.2
October	4,515	1,178	5,769	11,462	8.5
November	5,502	1,195	3,239	9,936	7.4
December	8,911	906	3,056	12,873	9.5
TOTAL	77,480	8,964	48,648	135,092	100.0

Source: Anuario Estadístico de Pesca 1993, SERNAP.

TABLE 14

**CHILE: 1993 FACTORY VESSEL CAPTURE IN INTERNATIONAL WATERS
BY SPECIES AND MONTH
(metric tons)**

MONTH	FISH	MOLLUSKS	CRUSTACEANS	TOTAL	% OF TOTAL
January	2,610	-	-	2,610	16.0
February	664	-	-	664	4.1
March	700	-	2,554	3,254	20.0
April	1,560	490	707	2,757	16.9
May	1,562	351	-	1,913	11.8
June	1,528	-	-	1,528	9.4
July	998	-	-	998	6.1
August	617	-	-	617	3.8
September	554	-	-	554	3.4
October	434	-	-	434	2.7
November	119	-	-	119	0.7
December	826	-	-	826	5.1
TOTAL	12,172	841	3,261	16,274	100.0

Source: Anuario Estadístico de Pesca 1993, SERNAP.

TABLE 15

**CHILE: 1993 INDUSTRIAL VESSEL CAPTURE IN INTERNATIONAL WATERS
BY SPECIES AND MONTH
(metric tons)**

MONTH	FISH	MOLLUSKS	CRUSTACEANS	TOTAL	% OF TOTAL
January	-	-	-	-	0.0
February	54	-	-	54	4.5
March	122	-	-	122	10.1
April	92	-	9	101	8.3
May	37	-	14	51	4.2
June	274	-	-	274	22.6
July	319	-	-	319	26.3
August	93	-	-	93	7.7
September	87	-	-	87	7.2
October	34	-	-	34	2.8
November	47	-	-	47	3.9
December	29	-	-	29	2.4
TOTAL	1,188	-	23	1,211	100.0

Source: Anuario Estadístico de Pesca 1993, SERNAP.

TABLE 16

CHILE: 1989 - 1993 UTILIZATION OF COMMERCIAL LANDINGS
(metric tons)

CATEGORY	1989	1990	1991	1992	1993	% CHANGE 1993/1992
Fish Meal	5,752,121	4,449,526	5,309,951	5,551,211	5,150,275	-7.2
Fresh/Chilled	333,114	23,999	25,957	29,882	33,107	10.8
Frozen*	222,160	176,495	196,352	247,548	230,392	-6.9
Canned	318,072	319,729	282,353	312,740	273,450	-12.6
Dried/Salted	6,954	6,735	7,504	2,200	5,445	147.5
Smoked	392	707	422	387	645	66.7
Other	-	67,160	65,884	54,686	48,441	-11.4
SUB-TOTAL	6,632,813	5,044,351	5,888,423	6,198,654	5,741,755	-7.4
Not Processed	-	378,896	277,658	429,711	448,893	4.5
TOTAL	6,632,813	5,424,247	6,166,081	6,628,365	6,190,648	-6.6

* Includes raw material processed on board factory vessels.

Source: Anuario Estadístico de Pesca 1993, SERNAP.

TABLE 17

CHILE: 1989 - 1993 PRODUCTION LEVELS OF PROCESSED FISHERY PRODUCTS
(metric tons)

CATEGORY	1989	1990	1991	1992	1993	% CHANGE 1993/1992
Fish Meal	1,381,162	1,073,207	1,229,758	1,269,257	1,188,692	-6.3
Fish Oil	260,078	188,270	241,211	152,989	191,177	25.0
Canned	83,970	79,146	64,073	76,274	71,202	-6.6
Frozen	94,694	115,844	117,763	151,329	112,669	-25.5
Fresh/Chilled	8,933	15,570	18,886	20,704	20,467	-1.1
Dried/Salted	2,825	2,716	2,033	858	2,993	248.8
Smoked	205	422	241	200	428	114.0
Algae Products	1,336	1,589	2,228	2,614	6,781	159.4
OTHER	61	188	224	5	3	-40.0
TOTAL	1,833,264	1,476,952	1,676,417	1,674,230	1,594,412	-4.8

Source: Anuario Estadístico de Pesca 1993, SERNAP.

TABLE 18

**CHILE: 1993 FISHERY EXPORTS
BY TYPE OF FISHERY**

CATEGORY	QUANTITY			VALUE FOB		
	Metric Tons	% of Total	% Change 1993/1992	US\$ (000's)	% of Total	% Change 1993/1992
Pelagic	1,054,549	85.5	11.9	471,065	40.2	-27.7
Demersal	74,677	6.1	-3.2	195,963	16.7	-13.1
Benthonic	42,811	3.5	11.0	212,954	18.2	39.2
Cultivated	60,750	4.9	21.8	291,757	24.9	9.9
Other	157	0.0	195.8	219	0.0	555.9
TOTAL	1,232,944	100.0	-10.0	1,171,958	100.0	-9.5

Source: Boletín de Estadísticas, December 1993, IFOP.

TABLE 19

**CHILE: 1993 FISHERY EXPORTS
BY COMMERCIAL CATEGORY**

CATEGORY	QUANTITY			VALUE FOB		
	Metric Tons	% of Total	% Change 1993/1992	US\$ (000's)	% of Total	% Change 1993/1992
Fish Meal	929,149	75.4	-14.1	367,055	31.3	-32.2
Fish Oil	72,983	5.9	28.7	19,112	1.6	26.0
Fresh/Chilled	34,629	2.8	20.5	157,463	13.4	10.8
Frozen	126,171	10.2	0.2	433,982	37.0	-0.8
Canned	41,895	3.4	-13.7	138,513	11.8	27.0
Dried/Salted	2,199	0.2	151.9	4,910	0.4	18.1
Smoked	100	0.0	199.1	1,123	0.1	188.2
Algae Products	25,651	2.1	-8.5	47,289	4.0	10.1
Other	167	0.0	-30.9	2,509	0.2	-18.1
TOTAL	1,232,944	100.0	-10.0	1,171,958	100.0	-9.5

Source: Boletín de Estadísticas, December 1993, IFOP.

TABLE 20

**CHILE: 1992 - 1993 EXPORTS OF FISH MEAL
BY COUNTRY**

COUNTRY	QUANTITY IN METRIC TONS			VALUE IN US\$ FOB		
	1992	1993	% Change 1993/1992	1992	1993	% Change 1993/1992
Taiwan	234,158	198,920	-15.0	122,889	86,066	-30.0
Japan	244,555	161,986	-33.8	123,993	67,246	-45.8
Holland	38,396	86,489	125.3	18,569	30,139	62.3
West Germany	180,936	80,172	-55.7	84,426	26,766	-68.3
Mexico	27,492	70,813	157.6	13,216	26,161	98.0
South Africa	90,967	64,697	-28.9	46,229	24,585	-46.8
Indonesia	25,167	52,872	110.1	13,148	22,316	69.7
Thailand	14,819	51,352	246.5	7,688	20,548	167.3
Italy	44,346	44,128	-0.5	21,301	16,952	-20.4
U.S.A.	13,649	25,395	86.1	6,660	9,122	37.0
Spain	13,003	13,889	6.8	6,330	5,089	-19.6
China	64,428	12,358	-80.8	31,877	4,908	-84.6
Canada	10,187	8,169	-19.8	5,090	3,564	-30.0
Other	79,028	57,909	-26.7	39,605	23,593	-40.4
TOTAL	1,081,131	929,149	-14.1	541,021	367,055	-32.2

Source: Boletín de Estadísticas, December 1993, IFOP.

TABLE 21

**CHILE: 1992 - 1993 EXPORTS OF FISH OIL
BY COUNTRY**

COUNTRY	QUANTITY IN METRIC TONS			VALUE IN US\$ FOB		
	1992	1993	% Change 1993/1992	1992	1993	% Change 1993/1992
Holland	9,766	26,885	175.3	2,475	6,983	182.2
United Kingdom	20,383	21,432	5.1	5,334	5,356	0.4
Mexico	19,771	14,830	-25.0	5,418	4,117	-24.0
U.S.A.	-	5,880	-	-	1,399	-
West Germany	3,350	3,000	-10.4	955	774	-18.9
Australia	-	600	-	-	177	-
Colombia	20	62	211.7	11	93	759.4
China	-	176	-	-	78	-
Other	3,419	118	-96.5	979	135	-86.2
TOTAL	56,709	72,983	28.7	15,172	19,112	26.0

Source: Boletín de Estadísticas, December 1993, IFOP.

TABLE 22
WORLD PRODUCTION OF SALMON AND TROUT
1989 - 1993
(thousands of metric tons)

	1989	1990	1991	1992	1993	% of 1993
WORLD PRODUCT	987	1,002	1,072	957	1,310	100.0
WILD SALMON:						
Alaska	330	307	317	306	384	29.3
Canada	84	91	84	52	104	7.9
Japan	198	223	246	189	221	16.9
Others	125	55	44	32	181	13.8
Total	737	676	691	579	890	67.9
FARMED SALMON & TROUT	250	326	381	378	420	32.1
% FARMED	25%	33%	36%	40%	32%	

Source: Asociacion de Productores de Salmon y Trucha de Chile A.G.

TABLE 23
WORLD PRODUCTION OF FARMED SALMON AND TROUT
1989 - 1993
(metric tons)

COUNTRY	1989	1990	1991	1992	1993	CHANGE 1993/1992
Norway	118,590	161,500	160,600	148,000	170,000	14.9
Chile	8,050	23,810	32,800	49,870	60,700	21.7
U.K.	38,000	40,000	60,600	48,800	48,600	-0.4
Canada	11,700	18,800	26,900	26,900	32,400	20.4
Japan	19,000	21,000	27,000	25,000	21,000	-16.0
Finland	16,000	18,400	18,100	17,100	16,100	-5.8
Faroe Island	4,000	5,000	16,000	18,000	15,000	-16.7
Ireland	9,000	10,000	9,300	10,500	10,000	-4.8
U.S.	6,000	6,000	7,100	9,000	10,000	11.1
Others	19,200	21,300	22,100	24,700	36,400	47.4
TOTAL	249,540	325,810	380,500	377,870	420,200	11.2

Source: Asociacion de Productores de Salmon y Trucha de Chile A.G.

TABLE 24

**CHILE: 1990 - 1993 SALMON AND TROUT EXPORTS
BY MAJOR MARKET**
(thousands of US\$ FOB)

MARKET	1990	1991	1992	1993	% of 1993	% CHANGE 1993/1992
Japan	57,666	90,301	162,029	162,583	55.8	0.3
U.S.A.	48,831	56,186	74,055	91,044	31.2	22.9
European Community	6,119	9,390	24,037	30,008	10.3	24.8
Latin America	1,450	1,953	2,908	5,318	1.8	82.9
Other	1,660	1,040	2,303	2,534	0.9	10.0
TOTAL	115,726	158,869	265,332	291,487	100.0	9.9

**CHILE: 1990 - 1993 SALMON AND TROUT EXPORTS
BY MAJOR MARKET**
(metric tons)

MARKET	1990	1991	1992	1993	% of 1993	% CHANGE 1993/1992
Japan	12,645	18,102	28,643	34,019	56.0	18.8
U.S.A.	8,896	11,600	15,179	19,074	31.4	25.7
European Community	1,795	2,612	5,177	6,345	10.4	22.6
Latin America	206	294	425	828	1.4	94.8
Other	271	198	447	462	0.8	3.4
TOTAL	28,813	32,805	49,871	60,728	100.0	21.8

**CHILE: 1990 - 1994* SALMON AND TROUT EXPORTS
BY SPECIES**
(metric tons)

SPECIES	1990	1991	1992	1993	% of 1993	1994
Coho Salmon	9,995	14,108	17,565	17,960	29.6	24,000
King Salmon	246	496	612	400	0.7	400
Atlantic Salmon	9,529	12,614	20,490	25,698	42.3	31,000
Sakura	23	60	90	-	-	-
Trout	4,020	5,527	11,114	16,670	27.5	19,600
TOTAL	23,813	32,805	49,871	60,728	100.0	75,000

* 1994 figures are forecasts

Source: Asociacion de Productores de Salmon y Trucha de Chile A.G.

TABLE 25

**CHILE: 1989 - 1993 SALMON AND TROUT EXPORTS
BY COUNTRY
(thousands of US\$ FOB)**

COUNTRY	1989	1990	1991	1992	1993	% of 1993
Japan	27,668	57,666	90,301	162,029	162,583	55.8
U.S.A.	10,320	48,831	56,186	74,055	91,044	31.2
France	2,039	1,734	3,737	7,140	8,875	3.0
Germany	991	2,330	2,242	9,360	8,560	2.9
Denmark	-	-	-	1,524	5,538	1.9
U.K.	240	526	548	1,707	2,784	1.0
Spain	9	301	1,393	1,492	2,612	0.9
Argentina	94	372	739	1,216	1,805	0.6
Brazil	758	1,019	1,108	1,062	1,651	0.6
Australia	-	641	234	1,035	1,067	0.4
Holland	1,661	545	468	496	748	0.3
Canada	137	843	512	522	571	0.2
Other	319	918	1,402	3,694	3,649	1.3
TOTAL US\$	44,236	115,726	158,869	265,332	291,487	100.0
TOTAL TONS	8,050	23,813	32,805	49,871	60,728	

Source: Asociacion de Productores de Salmon y Trucha de Chile A.G.

TABLE 26

**CHILE: 1989 SALMON AND TROUT EXPORTS
BY COUNTRY
(metric tons)**

COUNTRY	1989	1990	1991	1992	1993	% of 1993
Japan	4,397	12,645	18,102	28,643	34,019	56.0
U.S.A.	1,981	8,896	11,600	15,179	19,074	31.4
Germany	394	815	777	2,043	1,946	3.2
France	651	460	953	1,512	1,673	2.8
Denmark	-	-	-	259	978	1.6
Spain	5	60	414	460	817	1.3
U.K.	62	163	145	374	514	0.8
Brazil	150	159	188	152	287	0.5
Argentina	18	40	88	154	254	0.4
Australia	-	85	41	170	173	0.3
Holland	306	149	99	58	173	0.3
Others	86	342	398	867	820	1.4
TOTAL TONS	8,050	23,813	32,805	49,871	60,728	100.0
TOTAL MUSS	44,236	115,726	158,726	265,332	291,487	

Source: Asociacion de Productores de Salmon y Trucha de Chile A.G.

CHILEAN FISHERY SECTOR: KEY INDUSTRY CONTACTS

INSTITUTIONS

1. ARMADA DE CHILE

Dirreccion General del Territorio Maritimo y Marina Mercante

Errazuriz 537

Valparaiso

Ph: (56-32) 208 000

Fax: (56-32) 208 296

Direccion General del Instituto Hidrografico de la Armada

Comite Oceanico (CONA)

Errazuriz 232

Valparaiso

Ph: (56-32) 282 697

Fax: (56-32) 283 537

2. MINISTERIO DE ECONOMIA, FOMENTO Y RECONSTRUCCION

Subsecretaria de Pesca

(Subsecretariat of Fisheries)

Santiago Office: Teatinos 120, 11th Floor

Ph: (56-2) 698 1170

Fax: (56-2) 671 8143

Valparaiso Office: Bellavista 168, 17th Floor

Ph: (56-32) 212 187

Fax: (56-32) 212 790

Servicio Nacional de Pesca (SERNAP)

(National Fisheries Service)

Santiago Office: Teatinos 120, 8th Floor

Tel: (56-2) 698 0543

Fax: (56-2) 696 0784

Valparaiso Office: Yungay 1731, 4th Floor

Tel: (56-32) 217 390

Fax: (56-32) 259 564

Fundacion de Pescadores Artesanos (FUNCAP)

Teatinos 120, Of. 806

Santiago

Ph: (56-2) 695 2092

Fax: (56-2) 697 1658

Function: training and technical assistance for artisanal or independent fisherman

Instituto de Fomento Pesquero (IFOP)

(Fisheries Development Institute)

José Domingo Cañas 2277

Ñuñoa, Santiago

Ph: (56-2) 225 6325

Fax: (56-2) 225 4362

Empresa Maritima S.A. (EMPREMAR)

Almirante Gomez Carreño 49

Valparaiso

Ph: (56-32) 258 061

Fax: (56-32) 213 904

Function: Government owned company in charge of trading and maritime transport (to be privatized)

3. COMISION NACIONAL DE INVESTIGACION CIENTIFICA Y TECNOLOGICA (CONICYT)

Canada 308

Santiago

Ph: (56-2) 274 4537

Fax: (56-2) 209 729

Function: Government research

4. MINISTERIO DE RELACIONES EXTERIORES

Direccion de Politica Especial, Departamento del Mar

Morande 441, 2nd Floor

Santiago

Ph: (56-2) 698 0301

Fax: (56-2) 672 5071

Instituto Antartico Chileno
Av. Luis Thayer Ojeda 814
Providencia, Santiago
Ph: (56-2) 231 0105
Fax: (56-2) 232 0440

5. **EMPRESA PORTUARIA DE CHILE (EMPORCHI)**

Blanco 839
Valparaiso
Ph: (56-32) 257 167
Fax: (56-32) 259 937

Function: Government Port Authority

6. **FUNDACION CHILE**

Departamento de Recursos Marinos
Parque Antonio Rabat Sur 6165
Las Condes, Santiago
Ph: (56-2) 218 5211
Fax: (56-2) 242 6900

Function: private institution which commercializes new technologies in various sectors, including fisheries

7. **PROCHILE**

Fishery Area
Alameda B. O'Higgins 1315
Santiago
Ph: (56-2) 696 0043
Fax: (56-2) 696 0639

Function: Chilean trade office abroad, part of Foreign Affairs

8. **INSTITUTO DE INFORMACION PESQUERA VIII REGION S.A.**

Direccion General
Colon 2780
Talcaguano
Ph: (56-41) 583 741
Fax: (56-41) 583 939

Function: Fisheries Information Institute for the VIII Region

9. **CORPORACION DE PRODUCTORES DE HARINA Y ACEITE DE PESCADO (CORPESCA)**
(Association of Fishmeal and Fish Oil Producers)

Huerfanos 863, 9th Floor
Santiago
Ph: (56-2) 639 5244
Fax: (56-2) 639 1816

10. **ASOCIACION DE PRODUCTORES DE SALMON Y TRUCHAS DE CHILE**
(Association of Chilean Salmon and Trout Producers)

Alameda B. O'Higgins 949, Of. 2502
Santiago
Ph: (56-2) 699-2825
Fax: (56-2) 671-3765

FISHING COMPANIES (Main Private Companies)

1. **Pesquera Indio**
Huerfanos 863, Piso 3
Santiago
Ph: (56-2) 633 1155
Fax: (56-2) 639 3436
Products: Fishmeal, Fish Oil
2. **Pesca Chile S.A.**
Estado 10, Piso 8
Santiago
Ph: (56-2) 639 8139
Fax: (56-2) 639 4527
Products: Frozen Demersal, Salmon
3. **Pesquera San Jose S.A.**
Av. El Bosque Sur 0440, 10th Floor
Las Condes, Santiago
Ph: (56-2) 203 5300
Fax: (56-2) 203 5301
Products: Frozen and Canned Fish Products

4. **Pesquera Coloso**
 Av. El Bosque Sur 0440, 10th Floor
 Las Condes, Santiago
 Ph: (56-2) 203 5300
 Fax: (56-2) 203 5301
Products: Fishmeal, Fish Oil

5. **Pesquera Iquique Guanaye**
 Estado 337, 3rd Floor
 Santiago
 Ph: (56-2) 638 3577
 Fax: (56-2) 639 4738
Products: Fishmeal, Fish Oil

6. **Pesquera del Norte Ltda.**
 Lota 2267, 3rd Floor
 Providencia, Santiago
 Ph: (56-2) 233 0073
 Fax: (56-2) 234 3196
Products: Fishmeal, Fish Oil

7. **Pesquera Loa S.A.**
 Paseo P. Errazuriz Echaurren 2631
 Santiago
 Ph: (56-2) 231 6199
 Fax: (56-2) 231 0158
Products: Frozen Fish Products, Fishmeal, Fish Oil, Salmon

8. **Pesquera Fitz Roy**
 Las Urbinas 53, Of.72
 Providencia, Santiago
 Ph: (56-2) 231 5145
 Fax: (56-2) 232 4194
Products: Salmon, Canned, Frozen and Smoked Fish Products

9. **Pesquera El Golfo S.A.**
 Las Urbinas 53, Of. 151
 Providencia, Santiago
 Ph: (56-2) 231 8036
 Fax: (56-2) 231 5008



- Colon 2400
 Talcahuano
 Ph: (56-41) 585 239
 Fax: (56-41) 584 482
Products: Fishmeal, Fish Oil, Frozen and Fresh Fish Products
10. **Pesquera Frio Sur S.A.**
 Alameda B. O'Higgins 1980, 11th Floor
 Santiago
 Ph: (56-2) 696 5627 / 696 3305
 Fax: (56-2) 699 3417
Products: Salmon, Frozen and Fresh Fish Products
11. **Pesquera Yadrán**
 Av. Pte. Eduardo Frei M. 4800
 Santiago
 Ph: (56-2) 623 9131
 Fax: (56-2) 623 1830
Products: Salmon, Frozen and Fresh Fish Products
12. **Alimentos Marinos S.A.**
 Mar del Plata 2111
 Santiago
 Ph: (56-2) 251 3827
 Fax: (56-2) 225 6190
Products: Fishmeal
13. **Pesquera Nishiro Chile Ltda.**
 La Pastora 138, Of. D
 Santiago
 Ph: (56-2) 231 1904
 Fax: (56-2) 231 4047
Products: Salmon, Frozen Fish Products
14. **Aguas Claras Ltda.**
 Camino Manuel Rodríguez S/N
 Fundo El Guanaco, Malloco
 Ph: (56-2) 814 0013
 Fax: (56-2) 814 0173
Products: Trout and Salmon Producer

15. **Salmones Mainstream**
 Av. Pedro de Valdivia 0193, Of. 92
 Providencia, Santiago
 Ph: (56-2) 232 5537
 Fax: (56-2) 232 4686
Products: Salmon and Salmon Feed

16. **Salmones Antartica S.A.**
 Av. Providencia 2653, 15th Floor
 Santiago
 Ph: (56-2) 231 5148
 Fax: (56-2) 234 1155
Products: Salmon and Salmon Feed, Disease Lab

17. **Lefersa Alimentos S.A.**
 Panamericana Norte 6001
 Santiago
 Ph: (56-2) 623 3588
 Fax: (56-2) 623 3588
Products: Salmon

18. **Lever Chile S.A.**
 Carrascal 3551
 Santiago
 Ph: (56-2) 681 2511
 Fax: (56-2) 681 2127
Products: Salmon and Trout, Feed

19. **Salmones Aucar Ltda.**
 Amunategui 72, 2nd Floor
 Ph: (56-2) 698 8963
 Fax: (56-2) 698 7579
Products: Salmon and Trout

20. **Aquacultivos Ltda.**
 El Teniente 061
 Puerto Montt
 Ph: (56-65) 254 474
 Fax: (56-65) 255 552
Products: Salmon and Trout, Frozen Fish Products

21. **Algas Marinas S.A.**
 Fidel Oteiza 1956, 14th Floor
 Santiago
 Ph: (56-2) 205 5086
 Fax: (56-2) 205 5184
Products: Algae
22. **Aquasur Fisheries Ltda.**
 Jose Antonio Sofia 2747, Of. 203
 Providencia, Santiago
 Ph: (56-2) 234 4580
 Fax: (56-2) 233 3407
Products: Salmon, Canned and Frozen Fish Products
23. **Compañía Pesquera San Pedro S.A.C.I.**
 Av. 11 de Septiembre 1480, 14th Floor
 Providencia, Santiago
 Ph: (56-2) 235 2880
 Fax: (56-2) 235 9642
Products: Fishmeal, Fish Oil
24. **Conservas Multiexport**
 Camino a Coronel S/N
 Coronel
 Ph: (56-65) 257 877
 Fax: (56-65) 254 422
Products: Canned Fish Products
25. **Conservas Corral**
 San Rafael S/N
 Calbuco
 Ph: (56-65) 461 216
Products: Canned Fish Products
26. **Conservas Dalcahue S.A.**
 Bonbero Ossa 1010, Of. 320
 Santiago
 Ph: (56-2) 672 4546
 Fax: (56-2) 672 4546
Products: Canned Fish Products

27. **Cultivos Marinos Tongoy**
 Las Gaviotas 271 S/N
 Tongoy
 Casilla 271, Coquimbo
 Ph: (56-51) 391 260
 Fax: (56-51) 391 260
Products: Oysters, Scallops
28. **Empresa Pesquera Tarapaca**
 Mac Iver 125, 15th Floor
 Santiago
 Ph: (56-2) 639 3886
Products: Fishmeal, Fish Oil
29. **Fischer Llop y Cia.**
 Pedro Montt 72, Of. 302
 Puerto Montt
 Ph: (56-65) 257 877
 Fax: (56-65) 25 4422
Products: Salmon
30. **Industria Pesquera Francis Drake**
 Estado 10 Of. 1702
 Santiago
 Ph: (56-2) 638 0878
 Fax: (56-2) 633 7120
Products: Canned Fish Products
31. **Pacific Star**
 Huerfanos 979, Of. 204
 Santiago
 Ph: (56-2) 696 8133
 Fax: (56-2) 639 6409
Products: Salmon
32. **Pesquera Catalina Ltda.**
 Av. Barros Luco 2082
 San Antonio
 Ph: (56-2) 212 406
 Fax: (56-2) 212 856
Products: Fresh and Frozen Fish Products

33. **Pesquera del Sur**
 Agustinas 715
 Santiago
 Ph: (56-2) 639 6031
Products: Fishmeal, Fish Oil
34. **Pesquera Mar Azul**
 Av. General Jose de San Martin S/N
 Mejillones
 Ph: (56-55) 621 525
 Fax: (56-55) 621 525
Products: Fishmeal, Fish Oil, Canned Fish Products
35. **Pesquera Cabo de Hornos S.A.**
 Camino Norte Km 13 1/2
 Casilla 837
 Punta Arenas
 Ph: (56-61) 213 571
 Fax: (56-61) 213 593
Products: Canned and Frozen Fish Products
36. **Pesquera Mares Australes**
 Av. Diego Portales 1450
 Puerto Montt
 Ph: (56-65) 254 378
 Fax: (56-65) 254 378
Products: Salmon, Feed
37. **Robinson Crusoe**
 Hernando de Aguirre 391
 Providencia, Santiago
 Ph: (56-2) 231 0114
 Fax: (56-2) 233 3387
Products: Canned and Frozen Fish Products
38. **Salmones Tecmar**
 Gabriela Mistral 453
 Chonchi, X Region
 Ph: (56-65) 635 565
 Fax: (56-65) 635 565
Products: Salmon

39. **Sociedad Pesquera Bio-Bio**
Maturana 1296
Santiago
Ph: (56-2) 699 1059
Fax: (56-2) 699 1059
Products: Fishmeal, Fish Oil, Salmon, Canned Fish Products

40. **Sociedad Pesquera Ralun**
Felix de Amesti 21, Depto. 31
Las Condes, Santiago
Ph: (56-2) 206 5706 / 206 5978
Fax: (56-2) 206 3696
Products: Canned and Frozen Fish Products

41. **Salmones Unimarc S.A.**
Bandera 341, 3rd Floor
Santiago
Ph: (56-2) 697 4346
Fax: (56-2) 696 2220
Products: Salmon, Frozen Fish Products

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